DOCUMENT RESUME

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TITLE	OJT Trainer Orientation, 12-7. Military Curriculum Materials for Vocational and Technical Education.
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SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
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IDENTIFIERS	Military Curriculum Project

ABSTRACT

This course, developed from military curriculum materials for use in vocational and technical education, is designed to provide training in the skills and knowledge necessary to perform as a trainer in on-the-job training programs (OJT). The package includes information on the role of OJT, how to conduct training, evaluation techniques, and demonstration/performance exercises. Included in the course is an OJT training chart with instructions for use. Another component of the package, the Handbook for Air Force Instructors, is a general instructional guide that can be used for teaching any course. The areas covered in the handbook are lesson planning, lesson development, instructional methods and media, evaluation, and the student as an individual. Materials in the course package include lesson plans with objectives and evaluation criteria, information sheets, test items, and audiovisual aids. (KC)

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MILITARY CURRICULUM MATERIALS

The military-developed curriculum materials in this course package were selected by the National Center for Research in Vocational Education Military Curriculum Project for dissemination to the six regional Curriculum Coordination Centers and other instructional materials agencies. The purpose of disseminating these courses was to make curriculum materials developed by the military more accessible to vocational educators in the civilian setting.

The course materials were acquired, evaluated by project staff and practitioners in the field, and prepared for dissemination. Materials which were specific to the military were deleted, copyrighted materials were either omitted or approval for their use was obtained. These course packages contain curriculum resource materials which can be adapted to support vocational instruction and curriculum development.

The National Center Mission Statement

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

FOR FURTHER INFORMATION ABOUT
Military Curriculum Materials
WRITE OR CALL
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The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road, Columbus, Ohio 43210
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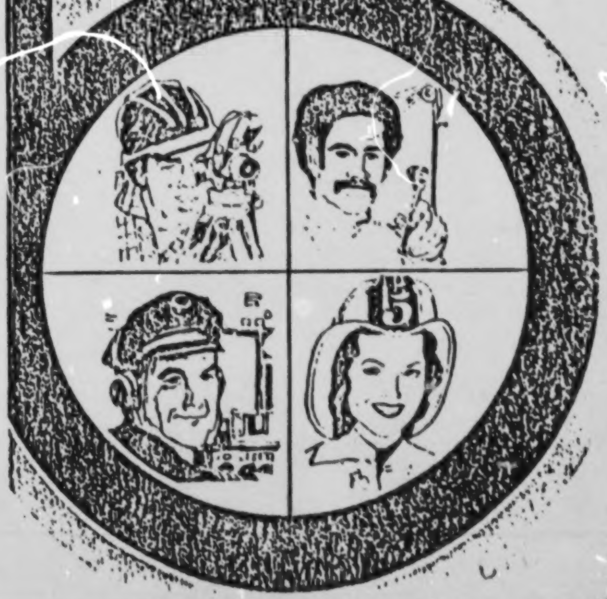
Military Curriculum Materials for Vocational and Technical Education

Information and Field
Services Division

The National Center for Research
in Vocational Education



Military Curriculum Materials Dissemination Is . . .

an activity to increase the accessibility of military-developed curriculum materials to vocational and technical educators.

This project, funded by the U.S. Office of Education, includes the identification and acquisition of curriculum materials in print form from the Coast Guard, Air Force, Army, Marine Corps and Navy.

Access to military curriculum materials is provided through a "Joint Memorandum of Understanding" between the U.S. Office of Education and the Department of Defense.

The acquired materials are reviewed by staff and subject matter specialists, and courses deemed applicable to vocational and technical education are selected for dissemination.

The National Center for Research in Vocational Education is the U.S. Office of Education's designated representative to acquire the materials and conduct the project activities.

Project Staff:

Wesley E. Budke, Ph.D., Director
National Center Clearinghouse

Shirley A. Chase, Ph.D.
Project Director

What Materials Are Available?

One hundred twenty courses on microfiche (thirteen in paper form) and descriptions of each have been provided to the vocational Curriculum Coordination Centers and other instructional materials agencies for dissemination.

Course materials include programmed instruction, curriculum outlines, instructor guides, student workbooks and technical manuals.

The 120 courses represent the following sixteen vocational subject areas:

- Agriculture
- Aviation
- Building & Construction Trades
- Clerical Occupations
- Communications
- Drafting
- Electronics
- Engine Mechanics
- Food Service
- Health
- Heating & Air Conditioning
- Machine Shop
- Management & Supervision
- Meteorology & Navigation
- Photography
- Public Service

The number of courses and the subject areas represented will expand as additional materials with application to vocational and technical education are identified and selected for dissemination.

How Can These Materials Be Obtained?

Contact the Curriculum Coordination Center in your region for information on obtaining materials (e.g., availability and cost). They will respond to your request directly or refer you to an instructional materials agency closer to you.

CURRICULUM COORDINATION CENTERS

EAST CENTRAL
Rebecca S. Douglass
Director
100 North First Street
Springfield, IL 62777
217/782-0759

MIDWEST
Robert Patton
Director
1515 West Sixth Ave.
Stillwater, OK 74704
405/377-2000

NORTHEAST
Joseph F. Kelly, Ph.D.
Director
225 West State Street
Trenton, NJ 08625
609/292-6562

NORTHWEST
William Daniels
Director
Building 17
Airdustrial Park
Olympia, WA 98504
206/753-0879

SOUTHEAST
James F. Shill, Ph.D.
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Mississippi State University
Drawer DX
Mississippi State, MS 39762
601/325-2510

WESTERN
Lawrence F. H. Zane, Ph.D.
Director
1776 University Ave.
Honolulu, HI 96822
808/948-7834

OJT Trainer Orientation J4AJF7500-001

Developed by: United States Air Force

Occupational Area: Curriculum Development - Instruction

Development and Review Dates:
May 1979

Target Audiences:
11 - Adult

Print Pages:
630

Availability: The National Center for Research in Vocational Education; ERIC

Contents:	**Type of Materials:**						**Instructional Design:**				**Type of Instruction:**	
	Lesson Plans:	Programmed Text:	Student Workbook:	Handouts:	Text Materials:	Audio-Visuals:	Performance Objectives:	Tests:	Review Exercises:	Additional Materials Required:	Group Instruction:	Individualized:
OJT Orientation	●				●			●			●	
Role of OJT	●				●						●	
How to Conduct Training	●		●		●	X					●	
Evaluation Techniques	●		●		●						●	
Demonstration/ Performance	●				●						●	

X Materials are recommended but not provided.

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Course Description:

The course is designed to provide training in the skills and knowledge necessary to perform as trainers in the On-The-Job-Training (OJT) Program. Scope of training includes the role of OJT, how to conduct training, evaluation techniques, and demonstration/performance. The objective is to have a standardized OJT program.

Included in the course is an OJT Training Chart with instructions for use.

The Handbook for Air Force Instructors included is a general instructional guide that can be used in teaching any course. The areas covered in the Handbook are; Lesson Planning, Lesson Development, Instructional Methods and Media, Evaluation, and the Student as an Individual.

OJT TRAINER ORIENTATION

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Plan of Instruction Page 3
Course Chart Page 22
Pretest Page 26
OJT Training Chart Page 48
OJT Training Manual Page 54
Handbook for Air Force Instructors Page 130

PLAN OF INSTRUCTION/LESSON PLAN PART I

NAME OF INSTRUCTOR	COURSE TITLE OJT TRAINER ORIENTATION
BLOCK NUMBER	BLOCK TITLE

1 COURSE CONTENT	2 TIME
1. COURSE ORIENTATION	1 Hour

SUPPORT MATERIAL AND GUIDANCE

Student Instructional Material
Locator Cards
WS ATC J4AJF75000-XXX-1
Reference Books (provided by instructor)
Pretest (optional)

Audiovisual Aids
None

Training Equipment
None

a. Welcome

b. Introduction

c. Course overview

d. Responsibilities of student

e. Policies and regulations, including grading procedures

f. Course completion criteria

g. Student Critique Program

h. Safety precautions

i. Shelter procedures

j. Conservation of energy

k. Privacy Act

l. Community College of the Air Force (CCAF)

SUPERVISOR APPROVAL OF LESSON PLAN (PART II)

SIGNATURE AND DATE	SIGNATURE AND DATE

PLAN OF INSTRUCTION NUMBER	DATE	PAGE NO.
J4AJF75000-001	1 May 1979	1

ATC FORM 133 OCT 75 PREVIOUS EDITION IS OBSOLETE

Instructional Guidance

Introduce yourself and welcome students, then have the students introduce themselves. Brief students on policies and location of facilities and cover grading procedures to be followed during the course. Pass out reference books and explain their responsibility for the care and return of books at the end of course. Explain the use of workbooks, worksheets, and student texts that will be provided throughout the course. Inform the students that they will be giving a presentation during the course. Explain that the presentation will be on a task from their JPG therefore to start thinking about the presentation now. Have students bring their training records NLT the third day of class. Consider administering the pretest during course orientation. Explain that the results of the pretest are used to identify subject matter that will be covered during the course, and to help identify areas that will require emphasis. After everyone has completed the pretest and it has been graded, discuss problem areas. Offer to readminister the test again at the conclusion of the course, so they can determine knowledge gained.

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2. ROLE OF OJT IN THE AIR FORCE 5 Hours

SUPPORT MATERIAL AND GUIDANCE

Student Instructional Material
WB ATC J4AJF75000-001-2
ST ATC J4AJF75000-XXX-2
AFR 50-38, Field Evaluations of Formal School Graduates
Specialty Training Standard (STS)
AFR 50-23, On-The-Job Training
AF Form 1284, Training Quality Report

Audiovisual Aids
None

Training Equipment
None

PAGES 4 & 5 OF THE POI HAS BEEN DELETED DUE TO MILITARY SPECIFIC INFORMATION.

b. Using AFR 50-23, select the requirements for skill level upgrade with no more than one error.
CTS: 1b

(1) Definition of OJT

(a) Planned program

(b) Supervised instruction

(c) Self study

(d) Accomplished while assigned to a duty position of the AFS

(2) Skill level upgrade requirements

(a) Career knowledge

(b) Job proficiency

(c) Job experience

(3) Types of OJT

(a) Upgrade training (UGT)

(b) Qualification training

(4) Training capability

Instructional Guidance
(2b) Ask students to define OJT. Consider different definitions, then have students compare their definitions with that listed in Chapter 1 of AFR 50-23. Explain that OJT is a planned training program and that the supervisor is responsible for the planning and identification of job requirements. Breakdown and explain each part of the definition. Ask student to state the requirements that must be satisfied prior to being upgraded to 3, 5, and 7 level. Note several responses on the C/B, after which, have students turn to AFR 50-23, Chapter 1 and compare the requirements listed in the regulation to those listed on C/B. Explain how each requirement is satisfied; AFR 39-1 identifies mandatory requirements and AFR 35-1, Table 6-4 identifies authorized substitutions. Identify and explain the two types of OJT. Explain that as trainers, they may be involved in providing both types of OJT. Have students complete part II of WB J4AJF75000-001-2.

c. Using AFR 50-23, select the definition of Dual Channel OJT with no more than two errors.
CTS: 1C

(1) Definition of dual channel OJT

(a) Systematic reportable application

(b) Self study

(c) Craftsman-apprentice

(2) Job proficiency

(a) Code key

(b) Identification of training requirements/contingency training

(c) Certification of proficiency

(3) Career knowledge

(a) STS/JPG technical reference

(b) Career Development Course (CDC)

Instructional Guidance
(2c) Have students define dual channel OJT. Consider different definitions, then have students compare their definitions with those listed in Chapter 1 of AFR 50-23. Thoroughly explain each part of the definition. Go into detail during the explanation of the job proficiency training and the trainers use of the Job Proficiency Guide (JPG). Explain the use of the code key and that this code key is the standard the trainee has to attain prior to certification. The supervisor is the only one authorized to certify job proficiency (except in certain circumstances). Explain the proficiency levels maybe raised to meet local requirements (up, but not down). Explain how the career knowledge training is accomplished. Explain that as trainers, they must make themselves available to the trainee (i.e., help with any problems with the CDC). Explain that they can assist the supervisor with the trainee during the accomplishment of the CDC. List the parts of the CDC and explain the use of each. Explain that if there is no CDC, the career knowledge training is accomplished through the use of the SRs in the STS/JPG. Using para 1-6 of AFR 50-23, explain that the responsiblity to complete knowledge training rests with the

COURSE CONTENT (CONTINUED)

individual and that responsibilities for providing proficiency training rests with all supervisors. Have students complete part III WB J4AJF 75000-001-2.

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3. HOW TO CONDUCT TRAINING 5.5 Hours

SUPPORT MATERIAL AND GUIDANCE

Instructional Material
AFR 50-23
AFM 50-62, Principles and Techniques of Instruction
WB J4ABF75000-001-3

Audiovisual Aids
LFS-75-1, Laws of Learning

Training Equipment
None

a. Using AFR 50-23 and AFM 50-62, select the principles of the learning process with no more than three errors.
CTS: 2a

(1) Define learning

(a) Change in behavior in response to a felt need

(b) Learning domains (learning outcomes)

1 Attitudes

2 Knowledge (mental skill)

3 Skill (physical skill)

(2) Characteristics of learning

(a) Purposeful

(b) Internalizing

(c) Active

(d) Multi-dimensional

(e) Common/Individual

(3) Laws of learning

(a) Readiness

(b) Effect

(c) Intensity

(d) Exercise

(e) Primacy

(f) Recency

Instructional Guidance
(3a) Ask for definition of learning from class. Consider several definitions provided by the students, then have the students compare their answers with those listed in AFM 50-62. Explain that trainees may possess the felt need, or the trainer will have to instill the

need in the trainee. Explain that learning has taken place in the trainee when this need has been satisfied. Explain that physical skills are the easiest of the learning domains (outcomes) to measure, the next is the mental skill, and the most difficult to measure is the change in attitude. While discussing characteristics of learning and the laws of learning refer to the training principles and techniques and tie each together. Example: learning comes through experience; trainee has to be active, activity - exercise (law of learning) provides the trainee the opportunity to exercise what has been taught and by having activity (exercise) the trainer can perform the follow-up (training technique). The trainee is on his/her own but the trainer is still available for assistance. At this point, the principle of "Trainee learns by doing" is applied. As the characteristics are discussed relate to the other principles, techniques, and laws of learning and give examples of how they are applied. As the areas of the learning process are covered, point out the duties from Table 4-6 of AFR 50-23, and emphasize each point. Stress that motivation is a continuous process and has to be reemphasized continually throughout the teaching period. Stress that no two trainees will learn at the same rate; point out that an indicator maybe the AQE scores. Ask for ways that differences may be identified, then go over the ways to compensate for individual differences. Stress that flexible assignment does not mean the trainee will not be required to demonstrate proficiency to the level indicated in the JPG. As the Laws of Learning are being covered, use film LFS-75-1. Have students complete part I, WB J4AJF75000-001-3.

b. Using AFM 50-62 and AFR 50-23, select the effects of motivation on learning with no more than two errors.
CTS: 2d

(1) Human Needs and Drives

(a) Physiological needs

(1) Food

(2) Drink

(3) Rest

(4) Activity

(b) Psychological Needs

(1) Safety

(2) Social

(3) Esteem (Egoistic)

(4) Self-fulfillment

(2) Defense Mechanisms (Learning Barriers)

(a) Rationalization

(b) Flight (withdrawal)

1 Physical

2 Mental

(c) Resignation

(d) Aggression

(3) Minimizing Frustration

(a) Treat each as individual

(b) Proper atmosphere

(c) Use good human relations

COURSE CONTENT (CONTINUED)

Instructional Guidance

(3b) Ask for the definition of motivation. Consider several definitions provided by students, then have students compare their definition with that listed in AFM 50-62, Chapter 2. As a force that impels a person toward a goal, the trainer uses the built in motivation of the trainee and builds/adds to this motivation to get the trainee to the established goal. Explain that human needs act as a motivation factor and that psychological needs will be the most difficult need for the trainer to satisfy. Explain how the trainer can satisfy/recognize these needs. Explain the defense mechanisms and then ask students for examples of each. Explain how to minimuze frustration. Have students complete part II of WB J4AJF75000-001-3.

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4. EVALUATION TECHNIQUES 1.5 Hours

SUPPORT MATERIAL AND GUIDANCE

Instructional Material

AFM 50-62, Principles and techniques
of Instruction
WB J4AJF75000-001-4

Audiovisual Aids

None

Training Equipment

None

a. Using AFM 50-62, select the relationship and general principles of evaluation techniques with no more than two errors.
CTS: 3

(1) Types of evaluation

(a) Written

(b) Oral

(c) Practical

(2) Characteristics of evaluation

(a) Reliability

(b) Validity

(c) Objectivity

(d) Comprehensiveness

(e) Discrimination

(3) Common rating errors

(a) Central tendency

(b) Standard

(c) Halo

1 Favorable

a Leniency

2 Unfavorable

a Sterotype

(d) Logic

Instructional Guidance
(4a) Explain that basically everyone believes that test results are used to determine how well that trainees are doing; however, they can also indicate how well the trainer is presenting the knowledge/skills to the trainees. Poor test results from the majority of the trainees under one trainer might indicate that the trainer is weak. Explain

that there are 3 types of evaluations and that the one type that is stressed here will be the performance. Ask what the trainees performance should be based on - response should be the proficiency level in the JPG. Explain that each trainee has to meet the minimum established in the JPG. Use Chapter 22 of AFM 50-62 to explain the characteristics of measurement. Give examples of each characteristic. Use Chapter 23 of AFM 50-62 to explain the common rating errors. Explain that all people who evaluate tend to make errors but that they can be lessened, and may be eliminated, but this requires training and a rating scale (checklist). Explain the checklist/evaluation format (part III, WB J4AJF75000-001-5). Have students complete WB J4AJF75000-001-4.

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5. DEMONSTRATION/PERFORMANCE 10 Hours

SUPPORT MATERIAL AND GUIDANCE

Instructional Material
AFR 50-23
AFM 50-62
WB J4AJF75000-001-5

Audiovisaul Aids
None

Training Equipment
None

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a. Using AFR 50-23 and a selected task from JPG, develop a task breakdown with no more than two errors. (2.5 Hours)
CTS: 4a MEAS: PT

(1) Purpose of task breakdown

(2) Format

(a) Important steps

(b) Key points

(3) Develop a task breakdown

Instructional Guidance
(5a) Explain that all tasks may not require a task breakdown. For tasks that have a number of steps involved, use Chapter 9 of AFR 50-23 to explain the format and procedures of developing a task breakdown. Relate the format to the checklist, explained during evaluation. Have students complete part I of WB J4AJF 75000-001-5. When students complete the objective, annotate the Criterion Checklist.

COURSE CONTENT (CONTINUED)

b. Using AFM 50-62 and using the previously selected task. (2.5 Hours) develop an introduction and conclusion with no more than two errors.
CTS: 4b MEAS: PT

(1) Introduction
  (a) Purpose
  (b) Attention
  (c) Overview
  (d) Motivation
  (e) Transition
(2) Conclusion
  (a) Purpose
  (b) Summary
  (c) Remotivation
  (d) Closure
(3) Prepare introduction and conclusion

Instructional Guidance
(5b) Use AFM 50-62, Chapter 14, to explain the introduction and conclusion. Stress that the introduction is going to set the stage/atmosphere for their presentation; it will have to be strong to gain attention and get the group motivated. The conclusion should stress the main points during the summary and the remotivation steps and should have the trainees wanting to get up and perform the task. Stress that you will not accept a "thank you" for the closure. Have students complete part II of WB J4AJF75000-001-5. When students complete the objective, annotate the Criterion Checklist.

c. Using AFM 50-62, present a 15-20 minute demonstration performance lesson with no more than two instructor assists. (2.5 Hours)
CTS: 4c MEAS: PT

(1) Principle of demonstration/performance

(a) Learn by doing

(b) Practice makes perfect

(2) Essentials of demonstration/performance method

(a) Explanation

1 Describe each step

2 Stress safety

3 Sequence

4 Encourage questions

(b) Demonstration

1 Exact procedures

2 Set standard

3 Combine with explanation

(c) Student performance, trainer supervision

1 Assist only as necessary

2 Safety precautions followed

(d) Evaluations

1 Based on observation

2 Based on predetermined standard

3 Discover how well task was taught

(3) Present demonstration

Instructional Guidance
(5c) Use AFM 50-62, Chapter 16, to explain the demonstration/performance method. Stress the essentials of the method, especially the adherence to the safety factors. Inform students that their presentation will be IAW this chapter. Consider using ATC Form 281 while critiquing the student. Inform students that everyone should be able to see the presentations and that they are required to observe the demonstrations and pay attention to the instruction. Those that are day-dreaming or can't see, "you" select to perform the task. When students complete the objective, annotate the Criterion Checklist.

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d. Using the previously developed task breakdown, evaluate trainees performance with no more than two errors. (2.5 Hours)
CTS: 4d MEAS: PT

(1) Standard of performance

(2) Use of evaluation tool

(3) Perform evaluation

Instructional Guidance
(5d) As the two selected trainees are performing the task, the student will use the checklist to insure correct performance. Insure evaluator understands use of the checklist. Assist as necessary. When the students complete the objective, annotate the Criterion Checklist.

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6. COURSE CRITIQUE AND GRADUATION 1 Hours

SUPPORT MATERIAL AND GUIDANCE

Student Instructional Material
ATC Forms 736, Student Critique
Completed AF Form 1256, Certificate
of Training

Audiovisual Aids
None

Training Equipment
None

a. Summary

b. Course Critique

c. Graduation

d. Safety briefing (if on Friday)

Instructional Guidance
Summarize course objectives, highlight the presentations, mention good areas and those needing improvement. Brief students on the need for and importance of the Student Critique Program. Pass out ATC Forms 736 to those students desiring to critique the course, with instructions for completing the form. Issue AF Form 1256.

DEPARTMENT OF THE AIR FORCE
Headquarters, Air Training Command
Randolph Air Force Base, Texas 78148

CTS J4AJF75000-001
(PDS Code VC6)
1 May 1979

OJT TRAINER ORIENTATION

1. Purpose. This course training standard (CTS) as prescribed by ATCR 50-21, Field Training Detachment (FTD) Program:

a. Establishes the tasks, knowledge, and proficiency level of training to be provided by Course J4AJF75000-001, OJT Trainer Orientation.

b. Provides the basis for the development of more detailed training materials, objectives, and training evaluation instruments for the course.

2. Course Description. The course covered by this standard is designed to provide training for Air Force personnel who possess any AFSC in the skills and knowledge necessary to perform as trainers in the OJT Program. Scope of training includes the role of OJT in the Air Force, how to conduct training, evaluation techniques, and demonstration/performance.

NOTE: This training is conducted under AFR 50-54. The objective is to have a standardized OJT Program throughout the Air Force. The primary means of achieving this objective through standardized courses presented by ATC OJT Advisiory Service instructors (See AFM 50-23).

3. Qualitative Requirements. Attachment 1 contains the list of tasks, knowledge, and proficiency references in paragraph 1.

4. Recommendations. Comments and recommendations are invited concerning quality of ATC training and graduates. Use this CTS as a reference and address correspondence to 3785 FLDTG/CC, Sheppard AFB, Texas 76311.

OFFICIAL

BENNIE L. DAVIS, General, USAF
Commander

D. S. WEART, Colonel, USAF
Director of Administration

1 Attachment
Qualitative Requirements

This standard supersedes CTS J4AJF75000-001, 1 May 1977.
Sheppard OPR and Approval Date: 3785th Field Training Group/TTFRJ, 1 May 1979.
DISTRIBUTION: HQ USAF/DPPTB-1; AFMPC/RTT1-1; HQ ATC/TTYAF-1; MAJCOMS-1; CTTC/TTGO-1; STTC/TRGOXU-1; 3785 FLDTG/TTFRJ-100.

QUALITATIVE REQUIREMENTS

CTS J4AJF75000-001

PROFICIENCY CODE KEY

	SCALE VALUE	DEFINITION: The Individual
TASK PERFORMANCE LEVELS	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. May not meet local demands for speed or accuracy. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. Meets minimum local demands for speed and accuracy. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
*TASK KNOWLEDGE LEVELS	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can determine step by step procedures for doing the task. (PROCEDURES)
	c	Can explain why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, identify, and resolve problems about the task. (COMPLETE THEORY)
**SUBJECT KNOWLEDGE LEVELS	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can explain relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATION)

– EXPLANATIONS –

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Examples: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

– This mark is used alone instead of a scale value to show that no proficiency training is provided in the course, or that no proficiency is required at this skill level.

X This mark is used alone in course columns to show that training is not given due to limitations in resources.

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TASK, KNOWLEDGE, AND PROFICIENCY LEVEL

1. ROLE OF OJT IN THE AIR FORCE	
a. Graduate Evaluation	B
b. Skill Level Upgrade	B
c. Dual Channel OJT Concept	B
2. HOW TO CONDUCT TRAINING	
a. Learning Process	B
b. Effects of Motivation on Learning	B
3. EVALUATION TECHNIQUES	B
4. DEMONSTRATION/PERFORMANCE	
a. Develop Task Breakdown	2b
b. Develop Introduction/Conclusion	2b
c. Present Demonstration	2b
d. Evaluate Performance	2b

Attachment 1

COURSE CHART

22

NUMBER J4AJF75000-001	PDS CODE VC6	DATE 1 May 1979
COURSE TITLE OJT Trainer Orientation		
SUPERSEDES COURSE CHART 4AJF75000-001, 1 May 1977	CENTER/DEPARTMENT/GROUP Sheppard/3785 FLDTG/TTFRJ	
APPLICABLE TRAINING STANDARD J4AJF75000-001		
OPR AND APPROVAL DATE TTAF, 14 Jan 77	COURSE SECURITY CLASSIFICATION UNCLASSIFIED	
INSTRUCTIONAL DESIGN Group/Lock Step	LOCATION OF TRAINING See AFM 50-5	TABLE ATTACHMENTS NA

COURSE LENGTH (4 ACADEMIC DAYS) (WARTIME COURSE LENGTH 3 ACADEMIC DAYS)	HOURS
Technical Training	24
Military Training	NA

REMARKS Instructor to student ratio is 1:10 minimum, 1:12 maximum. This ratio may be adjusted to fulfill base requirements. Procedures for course quota allocations and criteria for entry of students are contained in AFM 50-5, USAF Formal Schools Catalog.

Effective Date: 1 May 1979

TABLE I – MAJOR ITEMS OF EQUIPMENT

ATC Furnished Trainers and Equipment
None

Host Agency Furnished Equipment
None

ATC FORM MAY 78 449 REPLACES ATC FORM 449, MAR 76 AND ATC FORM 449 A, MAR 76

COURSE CHART J4AJF75000-001 - TABLE II - TRAINING CONTENT

COURSE MATERIAL - UNCLASSIFIED	24 HOURS
Course Orientation	(1.0 Hr)
Role of OJT in the Air Force	(5.0 Hrs)
How to Conduct Training	(5.5 Hrs)
Evaluation Techniques	(1.5 Hrs)
Demonstration/Performance	(10.0 Hrs)
Course Critique and Graduation	(1.0 Hrs)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SHEPPARD TECHNICAL TRAINING CENTER (ATC)
SHEPPARD AIR FORCE BASE, TEXAS 76311

17 MAY 1979

REPLY TO ATTN OF: 3785 FLDTG/TTFRJ

SUBJECT: Course Administration

TO: FTD_______/OJT Advisor

1. The attached documents are for the revised OJT Trainer Orientation Course, J4AJF75000-001. The following suggestions will aid you in presenting the course.

2. The pretest was developed as an optional item for you to use in determining the knowledge level of the students. The pretest is administered during the last 30 minutes of the "Orientation" and the first 30 minutes of the "Role of OJT." Time adjustments for the remainder of the course will be dependent on time spent administering and reviewing the pretest.

3. In covering the evaluation of technical school graduates, emphasize the use of the AF Form 1284, Training Quality Reporting. Using the cover page of the STS as a visual aid, explain the meaning of the proficiency code entries in columns 2a and 4a of section 2 of the STS. Briefly define the proficiency codes at this time. In-depth coverage will be accomplished during the "Proficiency Training" objective. Briefly explain the other evaluation techniques covered in AFR 50-38 and explain that as trainers, they will be working with the trainee on the job and have a better opportunity to identify any trainer deficiencies.

4. Consider having the students teach portions of the objectives, covering the Learning Process, Human Needs, and Evaluation Techniques. After each student has taught the assigned area, you can summarize and relate the area covered to Training Principles and Training Techniques in AFR 50-23. The principles and techniques should be incorporated into the Laws of Learning and Characteristics of Learning. While covering the Learning Process, show the film LFS 75-1 when it will fit into your presentation of the material. You will have to be very careful while covering this area that you don't run over into the next area on time, especially if you let students teach.

5. Explain the three types of evaluation, emphasize that as trainers, we will mainly be concerned with evaluating the trainees ability to apply the procedures taught and ability to perform the tasks taught. The type of evaluation they will mainly be concerned with is the practical evaluation, but keep in mind that oral evaluation is considered valid also.

Point out that questions they use should be thought provoking and should start with who, what, when, why, where, etc. Stay away from questions that require one word responses. Explain that these types of questions can be effectively used if followed up with explain, identify, etc.

6. Thoroughly cover the characteristics of evaluation, explaining that if the evaluation device they use contains the characteristics, it will be valid. Explain the common rating errors, giving examples of each and explaining how to overcome them.

7. Explain the demonstration method of instruction, stressing that the standard is set by the trainer during the demonstration. The trainees cannot be expected to accomplish the task any better than it was demonstrated to them. Stress that even though the trainer may know the job very well, time must be spent reviewing the steps involved to be able to teach it. Emphasize "To teach is to learn twice." At the completion of the demonstration method, move on to the task breakdown and the introduction and conclusion. The transition is included in the introduction and can be explained as, "a simple statement to bridge the gap between the introduction and the first important step in the task breakdown." After teaching the task breakdown and the conclusion, pass out the handout and have the student accomplish the task breakdown. Then have them write the introduction and conclusion. Stress that the introduction and conclusion cannot be written until the task breakdown has been accomplished. Point out that it is easier to "tell-them-what-you-are-going-to-tell-them" after you have developed the task breakdown. (Tell them what you are going to tell them, tell them, then tell them what you told them.) After the task breakdown and the introduction and conclusion are completed, have the students complete the evaluation checklist.

8. The student presentations should be ready at classtime the 4th day. Have the student demonstrate to the entire class and at the conclusion have the student trainer select two students to perform the task demonstrated. At this time, if you have noticed any student not paying attention, or that couldn't see all or part of the steps during the demonstration, you select that individual. This will emphasize to the student that everyone has to see all steps or they won't be able to perform as required. The student that presented the demonstration is to use the evaluation checklist during the trainee performance to check the steps involved in the task presented. At the conclusion of each presentation, ask for any comments from the class on the demonstration, then offer any constructive criticism that might improve the presentation. Keep in mind that this may be the first time many of the students have been in front of a group. Go easy on - OKs and - ahs, etc. This is not TIC.

MICHAEL T. STARLING, MSgt, USAF
Supt, OJT Adv Svc, 3735 Fld Tng Gp

PRETEST
J4AJF75000-001
OJT TRAINER ORIENTATION

27

1. The term, "position," indicates an individual's

    a. Place of employment.
    b. The duties and tasks identified on the STS.
    c. The qualifications of an individual who has been certified in the STS, past or present.
    d. The duties and tasks established as the work requirement for one individual.

2. The tasks that are identified as training requirements for upgrade training are identified by the

    a. Trainer.
    b. OJT manager.
    c. Immediate supervisor.
    d. Commander.

3. The three specific requirements that have to be satisfied for skill level upgrading are

    a. Job experience, time in-grade, career knowledge.
    b. Time in-grade, career knowledge, job proficiency.
    c. Upgrade training, qualification training, career knowledge.
    d. Career knowledge, job proficiency, job experience.

4. The Dual Channel Concept consists of

    a. Upgrade training, qualification.
    b. Job experience, job proficiency.
    c. Job experience, job knowledge.
    d. Career knowledge, job proficiency.

5. As a trainer you can be involved in providing qualification training.

    a. True
    b. False

6. The Proficiency Code Key in the STS establishes the

   a. Standard the trainee must attain.
   b. Minimum acceptable level of proficiency.
   c. Areas that must be identified by the supervisor as a training requirement.
   d. All of the above.

7. Upon receiving a technical school graduate, the supervisor identifies any training deficiency using AF Form

   a. 1098 and AFR 50-23.
   b. 2096 and AFR 35-1.
   c. 2095 and AFM 30-130, Vol II.
   d. 1284 and AFR 50-38.

8. The individual authorized to certify job proficiency as a prerequisite for UGT is the

   a. Commander.
   b. OJT manager.
   c. Supervisor.
   d. Trainer.

9. Career Knowledge Training must be satisfied prior to upgrading. This requirement may be met by

   a. The supervisor briefing the trainee on the theories, background information related to the tasks being taught; signed as certified on the AF Form 797.
   b. The satisfactory completion of the CDC.
   c. Assigning/completing the SRs in the STS/JPG.
   D. b and c above.

10. The purpose of assigning volumes of the CDC in a predetermined sequence is to

    a. Satisfy a requirement established by AFR 35-1, 50-23.
    b. Satisfy the one requirement of the dual channel concept.
    c. Allow concurrent development of knowledge and skill.
    d. Make it easier on the supervisor to keep track of where the trainee is in the CDC.

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11. If a CDC becomes available 15 days after a trainee enters UGT, it becomes mandatory to complete the CDC for upgrading.

    a. True
    b. False

12. The CDC is developed based on the

    a. Knowledge elements listed in the STS.
    b. Complexity of the AFS.
    c. Category of training.
    d. Degree of knowledge required by the trainee to perform in the AFS.

13. When selecting a trainer, the areas to be considered should include the ability to get along with people and

    a. Technical know-how.
    b. Length of service.
    c. Ability to inspire confidence.
    d. a and c.

14. The supervisor and the trainer are always the same individual for a trainee.

    a. True
    b. False

15. One of the duties of the trainer is

    a. To document review training on the ECI Form 9.
    b. To monitor CDC progression.
    c. To teach theory and background information as required.
    d. None of the above.

The trainer, under the guidance of the supervisor, is responsible to

a. Act as the holder of the CDC package and issue the trainee one volume at a time.
b. Conduct a review, with the trainee, of each VRE.
c. Conduct initial evaluation for newly assigned personnel.
d. Prepare a detailed task breakdown, indicating the important steps involved in the task.

17. Learning is best defined as

a. Developing a method to accomplish the job the easiest way possible.
b. A change in a person's physical ability.
c. A change in a person's mental ability.
d. A change in behavior, resulting from a person's interaction with their environment.

18. Learning may involve changes in any of three areas, these are

a. Manner of perceiving, manner of thinking and emotional reactions.
b. Emotional reactions, attitudes and physical behavior.
c. Physical behavior, manner of perceiving and thinking, and emotional reactions or attitudes.
d. Physical behavior, manner of thinking and manner of perceiving.

19. The most effective tool to encourage a trainee to learn is

a. Threat.
b. AFR 39-10/39-12.
c. Motivation.
d. Time off for job well done.

20. The individual responsible to implant the desire to learn in the trainee is

a. Supervisor/trainer.
b. OJT manager/trainer.
c. OJT manager/commander.
d. The individual trainee.

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21. The Law of Primacy indicates

    a. The state of being first.
    b. We learn more from the real thing than from a substitute.
    c. What is taught must be correct the first time.
    d. a and c.

22. The Law of Readiness implies

    a. The trainer must be able to answer all questions from the trainee.
    b. The things most often repeated are best remembered.
    c. That most recently taught is best remembered.
    d. An individual learns best when they are ready to learn.

23. Human needs are classified into two categories, these are

    a. Physiological and psychological.
    b. Social and self-fulfillment.
    c. Self-fulfillment and safety.
    d. Self-fulfillment and esteem.

24. The need the supervisor/trainer has most control over is the

    a. Social.
    b. Self-fulfillment.
    c. Esteem.
    d. Physical.

25. During the initial orientation, the supervisor is establishing the ground work and identifying the level of knowledge of the trainee. This approach is known as

    a. Being sure the trainee sees the job as a whole.
    b. Going from the known to the unknown.
    c. Emphasizing accuracy and understanding.
    d. Presenting new material in short units.

26. In developing a task breakdown, it consists of two columns. These are

    a. Important Steps, Key Points.
    b. Key Points, Sub-Points.
    c. Important Steps, Sub-Points.
    d. Task Points, Sub-Points.

27. The degree a task must be broken down depends on the

    a. Knowledge and ability of the trainer.
    b. Method this task is to be taught.
    c. Degree of knowledge and proficiency required.
    d. Past experience and learning capability of the trainee.

28. The purpose of the task breakdown is to

    a. Provide the trainee a step-by-step guide in accomplishing a task.
    b. Divide a big job into easy, progressive and teachable units.
    c. Pinpoint the items required to be taught by the trainer.
    d. a and c.

29. The form to be used in developing a task breakdown is

    a. AF Form 623a.
    b. AF Form 797.
    c. AF Form 1098.
    d. There is no form.

30. The standard a trainee is rated against is

    a. Other trainees working in the shop.
    b. Other individuals who have completed UGT.
    c. The proficiency level in the JPG.
    d. The proficiency level in AFR 39-1.

33

31. The three types of evaluation are

a. Written, practical, oral.
b. Practical, demonstration, oral.
c. Written, demonstration, oral.
d. Demonstration, performance, application.

32. A test that yields consistent results is considered as

a. Valid.
b. Objective.
c. Comprehensive.
d. Reliable.

33. A test that measures what it is supposed to measure is considered

a. Valid.
b. Objective.
c. Comprehensive.
d. Reliable.

34. A test that gives consistent results, but does not measure what it is supposed to measure is considered

a. Comprehensive without ability to differentiate.
b. Objective but not comprehensive.
c. Reliable but not valid.
d. Valid but not objective.

35. A test that does not sample liberally the task that is taught is missing the characteristic of

a. Reliability.
b. Validity.
c. Comprehensiveness.
d. Objectivity.

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36. A test that rates an individual against a predetermined standard is considered as

    a. Reliable.
    b. Valid.
    c. Objective.
    d. Comprehensive.

37. To lessen the subjectivity during evaluation which requires performance of the trainee, the use of a checklist would be required.

    a. True
    b. False

38. The purpose of the lesson plan:

    a. They can be used as check points.
    b. Serve as a teaching guide and as references for other trainers who may teach the lesson.
    c. Serve as a step-by-step guide for trainers in planning the lesson.
    d. All of the above.

39. During the performance phase, if the trainee is about to make a mistake, the trainer should let the trainee proceed, emphasizing, "We learn from out mistakes."

    a. True
    b. False

40. The motivation step is emphasized during the introduction and should be continued throughout the lesson and again reemphasized during the conclusion.

    a. True
    b. False

KEY TO PRETEST

1. d
2. c
3. d
4. d
5. a
6. d
7. d
8. c
9. d
10. c
11. b
12. a
13. d
14. b
15. c
16. d
17. d
18. c
19. c
20. a
21. d
22. d
23. a
24. d
25. b
26. a
27. d
28. b
29. d
30. c
31. a
32. d
33. a
34. c
35. c
36. c
37. a
38. d
39. b
40. a

1. This pretest is not mandatory to use with Course J4AJF75000-001, "OJT Trainer Orientation." This evaluation device has been developed as a tool for you to use in determining the knowledge level and background of the students attending the class. This pretest can give you an idea on where to concentrate your instruction and can be a motivating factor for the students by enabling them to see where their knowledge deficiencies are concerning OJT. It will also give the students an idea of the material that will be covered during the course.

2. If you decide to use the pretest, have the students complete it during the last 30 minutes of the "Orientation" and the first 30 minutes of the "Role of OJT." After students complete the pretest, review and discuss each question.

3. Offer to readminister the pretest at the completion of the course so that the students can see what they have learned.

4. Even though the pretest is not required, it can serve as a very beneficial tool in conducting the trainer course.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND
RANDOLPH AIR FORCE BASE TEXAS 78148

OJT ADVISORY SERVICE

WB ATC J4AJF75000-001-3
1 May 1979

How to Conduct Training

PART I

1. Learning is best defined as: (AFM 50-62, Page ___)

2. Learning may involve changes in any of three areas, what are they? (AFM 50-62, Page ___)

a. ______

b. ______

c. ______

3. Your most effective tool in encouraging a trainee to learn is motivation, why? (AFM 50-62, Page ___)

4. A student who studies photo-interpretation may learn to perform a specific operation, such as plotting aerial photography. But in the process, the individual learns new concepts, perhaps new applications of the principles of photography. Which characteristic of learning applies (AFM 50-62, Page ___)

This WB Supersedes WS ATC J4AJF75000-001-3
WB ATC J4AJF75000-001-1

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

5. Identify and explain three ways that may enable a trainer to compensate for individual differences in rates of learning. (AFM 50-62, Page ___)

a. ______________________________

b. ______________________________

c. ______________________________

6. How can the emotional reaction of a trainee affect the learning situation? (AFM 50-62, Page ___) ______________________________

7. In applying the training principles of recognizing trainee work and never trying to bluff, which law of learning will apply? (AFM 50-62, Page ___)

8. While training on a task, you employ the use of charts, posters, and actual equipment, which law of learning is being applied? (AFM 50-62, Page ___) ______________________________

9. How does applying "Go from the Known to the Unknown" help you plan your training approach.. ______________________________

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

10. Identify the five steps involved in training techniques. (AFM 50-23, Para ____)

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

PART II

1. Human Needs:

a. List at least two physiological needs that could affect your training program. (AFM 50-62, Page ____)

(1) ______________________________

(2) ______________________________

b. List and explain at least three psychological needs that might have an effect on your training program. (AFM 50-62, Page ____)

(1) ______________________________

(2) ______________________________

(3) ______________________________

2. List and describe three defense mechanism that could block the learning experience. (AFM 50-62, Page ____)

a. ______________________________

____

b. ______________________________

____

c. ______________________________

____

3. List and Explain three techniques to use in minimizing frustrations of the trainee. (AFM 50-62, Page ____)

a. ______________________________

____

b. ______________________________

____

c. ______________________________

____

4. Explain why being consistent is important to the trainee on the job, give an example of consistency. (AFM 50-62, Page____) ______________________________

____

____

____

5. Why is it important that a trainee be informed of mistakes when they are made? (AFM 50-62, Page____) ______________________________

____

____

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND
RANDOLPH AIR FORCE BASE, TEXAS 78148

OJT ADVISORY SERVICE

WB ATC J4AJF75000-001-4
1 May 1979

Evaluation Techniques

Match each statement with the applicable characteristic of evaluation (AFM 50-62, Page _____):

1. _____ Reliability
2. _____ Validity
3. _____ Objectivity
4. _____ Comprehensiveness
5. _____ Differentiate

a. An evaluation tool that produces consistent results.

b. A test that measures what it is supposed to measure.

c. A test that liberally samples what has been taught.

d. A test that detects small differences in trainees' abilities.

e. A test that is not affected by the personal bias of the trainer.

Match the common rating errors to the statement it best represents (AFM 50-62, Page _____):

6. _____ Likes and dislikes affect the rating.
7. _____ All trainees are the same.
8. _____ Redheads have hot tempers.
9. _____ The trainee should be good at typing because of demonstrated excellence in cooking.
10. _____ The pass, fail rate fluctuates between trainers.
11. _____ The rating that is given is based upon a preconception.

a. Halo.

b. Standard.

c. Central tendency.

d. Logical.

12. To lessen subjectiveness during an evaluation, a trainer should employ the use of what (AFM 50-62, Page _____): ________________________________

____

____

This WB supercedes WS ATC J4AJF75000-001-3

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND
RANDOLPH AIR FORCE BASE, TEXAS 78148

OJT ADVISORY SERVICE

WB ATC J4AJF75000-001-5
1 May 1979

Task Breakdown

PART I

1. What step of the five step training techniques are you using when you prepare a task breakdown? (AFM 50-23, Para ________) ______________________________

____

2. What is an "important step" of a task breakdown? (AFM 50-23, Para ________)

____

____

3. What is a "key point" of a breakdown? (AFM 50-23, Para ________) ______

____

____

4. Preparing a task breakdown:

a. Goal: The main object of a task breakdown is to divide a complicated, complex task into easy teachable units. As OJT Trainers, we must never forget our lesson on the learning process and the principles and techniques of instruction, nor leave out a single unit of instruction from our teaching.

b. Preparation: After the instructor has approved your task selection, develop a task breakdown using the attached format. The task breakdown must be approved by the instructor prior to proceeding to the evaluation device.

This WB supercedes WB ATC J4AJF75000-001-2 & WB ATC J4AJF75000-001-3

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

TASK: ______________________________

IMPORTANT STEP	KEY POINT

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

PART II

1. What is the purpose of a lesson plan? (AFM 50-62, Page ________)

2. Explain the importance of each of the following parts of a lesson plan.

   a. Attention:

   b. Overview:

   c. Motivation:

   d. Transition:

   e. Summary:

   f. Remotivation:

   g. Closure:

3. Preparing a lesson plan:

   a. Goal: The main objective in preparing a lesson plan, besides teaching a lesson, is smooth transition into a training environment. Keep in mind Chapter 15 of AFM 50-62 in lesson planning, and the whole-part-whole concept.

   b. Preparation: Prepare a lesson plan as outlined on the attached pages. Keep in mind that the main body of your lesson plan is the task breakdown you completed previously. The lesson plan must be approved by the instructor before proceeding to the next unit of instruction. This will be the format you will use for your 15-20 minute demonstration/performance lesson persentation.

DESIGNED FOR ATC COURSE USE
DO NOT USE ON THE JOB

LESSON PLAN

INTRODUCTION: (minutes)

ATTENTION:

OVERVIEW:

MOTIVATION:

TRANSITION:

CONCLUSION: (minutes)

SUMMARY:

REMOTIVATION:

CLOSURE:

PART III

EVALUATION CHECKLIST: ______________________________

[illegible] ______________________________

IMPORTANT STEPS	KEY POINTS	TRAINEE	
		S/U	S/U

This chart is designed for use in training civilian and military personnel. It provides a simple method of organizing and recording information about the job and the worker for training purposes. When properly prepared and used, the training chart will assist in:

Determining individual and group training needs.

Planning and scheduling training.

Determining the extent to which there is a trained staff as needed to perform the mission.

Determining the progress of training.

Making work assignments.

PREPARATION

1. Complete identifying data in the upper left corner of the chart.

2. Line 1 may be used to indicate the functions of the organizational unit, civilian position titles, or AFSCs *(for military personnel only)* in which training is to be given; for example, warehousing or warehouseman.

3. Line 2 may be used to indicate a breakdown of the various segments or divisions of work which make up the functions or the positions or AFSCs; for example, shipping, receiving, inventory, and storage.

4. List on the diagonal lines *(line 3)*, breakdown of segments of work indicated in line 2 into work units, tasks, skills, or operations which are performed; for example, processing AF Form 104b, posting stock record balance. For training courses, units of courses may be listed.

5. Line 4 may be used either to:

a. Identify by number the operations or tasks as a cross-reference to operation breakdowns or major headings of course outlines; or

b. Indicate the number of hours required to accomplish the training listed under any operation, task, or unit of a course.

6. List in column 5 the names of personnel assigned to perform the work units, tasks, skills, or

operations, or assigned to a course of instruction. Names may be listed alphabetically, or by grade or rank from the highest to the lowest.

7. Consider each individual listed in regard to each work unit, task, skill, or operation indicated in line 3. Block by block, indicate whether training is needed, using the following suggested symbols as aids. Other symbols or numbers may be used, if desired.

⊟	Worker does not need to perform the work unit or know the skill as it is not required in present assignment.
☒	Worker can perform the work and training is not needed. *(Use this symbol when the worker performs with a minimum of supervision and meets all the work requirements as to quality, quantity, and manner of performance.)*
☐	Worker cannot perform the work, but training will not be scheduled until a later date as he does not need to be trained immediately.
12-1	Worker should know the work and is scheduled for training, which is to be completed by date shown. Express date in numerals to indicate month and day.

8. The following additional symbols may be used when it is desired to show degrees of partial performance ability by the worker:

⧅	Worker's performance indicates that he is approximately 75 percent trained.
⧄	Worker's performance indicates that he is approximately 50 percent trained.
⟋	Worker's performance indicates that he is approximately 25 percent trained.

9. Column 6 may be used for remarks or notes as desired by the supervisor or instructor. For example, beginning and ending dates of on-the-job training period may be shown.

operations, or assigned to a course of instruction. Names may be listed alphabetically, or by grade or rank from the highest to the lowest.

7. Consider each individual listed in regard to each work unit, task, skill, or operation indicated in line 3. Block by block, indicate whether training is needed, using the following suggested symbols as aids. Other symbols or numbers may be used, if desired.

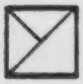
⊟ Worker does not need to perform the work unit or know the skill as it is not required in present assignment.

☒ Worker can perform the work and training is not needed. *(Use this symbol when the worker performs with a minimum of supervision and meets all the work requirements as to quality, quantity, and manner of performance.)*

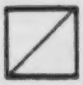
☐ Worker cannot perform the work, but training will not be scheduled until a later date as he does not need to be trained immediately.

12-1 Worker should know the work and is scheduled for training, which is to be completed by date shown. Express date in numerals to indicate month and day.

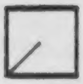
8. The following additional symbols may be used when it is desired to show degrees of partial performance ability by the worker:



Worker's performance indicates that he is approximately 75 percent trained.



Worker's performance indicates that he is approximately 50 percent trained.



Worker's performance indicates that he is approximately 25 percent trained.

9. Column 6 may be used for remarks or notes as desired by the supervisor or instructor. For example, beginning and ending dates of on-the-job training period may be shown.

TRAININ

ORGANIZATIONAL UNIT

1

2

SUPERVISOR OR INSTRUCTOR

(Check applicable box)

☐ ON-THE-JOB ☐ OFF-THE-JOB

3

4

DATE INITIATED

5

ING CHART

TASKS, SKILLS, OR OPERATIONS

6

AF FORM JAN 55 1320

AFR 50-2354

AIR FORCE REGULATION

TRAINING

ON-THE-JOB TRAINING

29 MAY 1979

DEPARTMENT OF THE AIR FORCE

DEPARTMENT OF THE AIR FORCE
Headquarters US Air Force
Washington DC 20330

CHANGE 1
AFR 50-23
16 May 1980

Training

ON-THE-JOB TRAINING

AFR 50-23, 29 May 1979, is changed as follows:

1. **Page Insert Changes.** New or revised material is identified by a ✱ .

Remove	Insert
iii, iv	iii, iv
2-3, 2-4	2-3, 2-4
	3-3
4-3 thru 4-10	4-3 thru 4-10
5-1, 5-2	5-1, 5-2
6-1, 6-2	6-1, 6-2
6-5 thru 6-8	6-5 thru 6-7
7-3 thru 7-6	7-3 thru 7-7
10-1, 10-2	10-1, 10-2
A3-1 thru A3-5	A3-1, A3-2
A5-1, A5-2	A5-1, A5-2
	A8-1

2. **Write-In Changes:**

Page	Reference	Line	Action
ii	Chapter 3	9	Add "Applying ISD to Proficiency/Qualification Training Channel of OJT . . . 3-8 . . . 3-3".
1-1	1-2d	1,3,6	Insert "AFS" between lateral and training
1-3	1-7	11	Change "feld" to "field".
2-5	Table 2-3 note 1b(1)	6	Change "twice a year" to "at least every 90 days"
2-6	Table 2-5 note 1	13	After "to" and before "HQ AFRES" add "either"; after "31098" add "or to the ANGSC/TET, Andrews AFB MD 20334."
2-7	Table 2-6, rule 1, colm E		Delete reference to note "1".
	Table 2-6, rule 2, colm B		Delete reference to note "1".
	Table 2-6, rule 4, colm E		Delete reference to note "1".
	Table 2-6, note 1		Delete.
2-8	Table 2-7, note 1	3	Add "(Optional for ANG personnel.)"
3-2	3-7c(3)	2	Change "6" to "4".
	3-7c(4)	1	Add the word "Unit" before "OJT".
4-2	Figure 4-1 under Sq Comdr		Change "Administrator" to "Manager".
4-11	Table 4-5, duty 21, colm A	1	Delete "2-2 or" after "table".
		2	Change "table 2-2, note 5" to "para 2-6".
	Table 4-5, duty 22, colm A	2	Change "7-12" to "7-15".
5-3	6-7	1	Change "6-2" to "6-1".
		5	Change "6-3" to "6-2".
	6-9	2	Change "6-4' to "6-3".
7-2	7-6a	3, 4	Delete "only authorized".
		6	Add "Available courses are listed on PDS Central Table 394."
8-4	Table 8-1, step 5, colm B	1	Add "(see note 3)".
	Step 6, colm B	1	Delete "(see notes 3 and 4)".
	Step 8, colm B	1	Delete "(see note 4)".
8-5	Note 4		Delete.
10-3	Summary	6	Change "proposed" to "purpose".
A1-2	Para 30	1	After "Lateral" insert "AFS".

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AF REGULATION 50-23
56
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Training

ON-THE-JOB TRAINING

This regulation outlines policy and provides procedures to personnel who are responsible for planning, conducting, administering, and managing the Air Force On-The-Job Training (OJT) Program to ensure that the qualitative and quantitative skill requirements needed by the Air Force are attained. It explains the Dual Channel OJT Program, which is designed to produce highly competent technical personnel in a minimum amount of time; explains when to enter airman into OJT; and lists and explains published control documents for planning and recording OJT. This regulation applies to all enlisted personnel and to officers and civilians who supervise enlisted personnel.

This publication is affected by the Privacy Act of 1974. Each form that is subject to provisions of AFR 12-35, paragraph 30 and required by this publication contains a Privacy Act Statement, either incorporated in the body of the document or in a separate statement accompanying each such document. Title 10 U.S.C. 8012 and E.O. 9397, 22 November 1943, are the authorities to collect and maintain the data contained in the system of records.

Proposed supplements that affect any military personnel function, performed at MAJCOM level or below, are processed as prescribed in AFR 5-13. Other proposed regulations or supplements that affect OJT policy or OJT management must be reviewed by the major command OJT manager before being sent to HQ AFMPC/MPCRTT for approval prior to publication.

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Chapter 1

ROLE OF ON-THE-JOB TRAINING (OJT) IN THE AIR FORCE

1-1. Integrated Training Program. The Air Force on-the-job training (OJT) program provides training for Air Force enlisted personnel to qualify them in the knowledge and job proficiency required to perform duty in an Air Force specialty (AFS). All Air Force organizations with assigned enlisted personnel conduct OJT.

a. Relationship Between Formal Training and OJT. Air Force airmen technical training requirements are met by an integrated program involving all Air Force commands and some schools of the Army, Navy, and other Government agencies. The Air Force conducts a continuous and aggressive OJT program as a part of its integrated training program. Headquarters USAF, Director of Personnel Programs establishes training policies to ensure that OJT is integrated with all other elements of training. The Air Force Manpower and Personnel Center (AFMPC), Training Management Division provides overall management for the OJT Program. The Air Force recognizes that there are three specific requirements that airmen must satisfy to qualify for skill level upgrading. These requirements are career knowledge, job proficiency, and job experience. The Air Force dual channel OJT program is designed to satisfy the requirements for career knowledge and job proficiency. The requirement for job experience is satisfied when airmen satisfactorily perform duty in their AFS for the minimum time specified in AFR 35-1, Military Personnel Classification Policy.

b. Formal Training:

(1) Formal Air Force training includes training conducted both in approved courses and on-the-job. Air Training Command (ATC), in coordination with major commands (MAJCOMs), determines the requirements for, prepares, evaluates, and revises specialty training standards (STSs). These standards specify the amount of knowledge and skill required for training. They are the primary control documents for formal resident courses, career development courses (CDCs), OJT (job proficiency guides), and specialty knowledge tests (SKTs). CDCs are used in conjunction with job proficiency training in the Air Force Dual Channel OJT Program and as the primary reference for most SKT questions. The Extension Course Institute (ECI) publishes and administers CDCs.

(2) Each MAJCOM must plan, conduct, and evaluate OJT according to this regulation through practical application of the Dual Channel OJT Program. In this regulation, references to the Dual Channel OJT Program apply to that part of Air Force training that conforms to the definition of OJT.

c. On-The-Job Training. On-the-job training is a planned training program designed to qualify airmen, through self-study and supervised instruction, to perform in a given AFS while actually working in a duty assignment of their AFS.

1-2. Relationship of OJT, Upgrade Training (UGT), Qualification Training, Retraining, and Lateral Training:

a. OJT and UGT. On-the-job training is an all-inclusive term which describes the training received by an airman while he or she is performing in a duty assignment of the AFS. Training for the purpose of upgrading an airman's skill level in his or her AFSC is referred to as upgrade training (UGT). Training administered for the purpose of increasing knowledge and skill in an awarded AFSC, but not resulting in award of an AFSC, is referred to as qualification training.

b. Qualification Training. A program of qualification training designed to develop more knowledge and skill within an airman's assigned position is a basic part of the OJT program, but it does not result in the award of an AFSC. Qualification training does not require the use of special orders; AF Form 2095, Assignment/Personnel Action; AF Form 2096, Classification/On-The-Job Training Action; or AF Form 299, Request for Retraining/Lateral Training, but it does require entries on the job proficiency guide (JPG).

(1) Qualification training provides additional training for airmen who have already been upgraded in their specialties. It provides a practical application of the commander's awareness of the need for gearing the capabilities of the unit to changing Air Force concepts, requirements, equipment, and unit missions as well as recognizing that there is always a need for increased skill and knowledge within the broad confines of each skill level. Qualification training becomes critical when the commander is faced with the need for increasing the quality or amount of production, indoctrinating personnel in new techniques or procedures, or qualifying technicians to maintain new equipment.

(2) Proper application of qualification training provides additional valuable experiences for all airmen who have been upgraded in their specialties to the 5- or 7-skill level.

c. Retraining Programs. Retraining through OJT is defined in AFR 39-4, Airman Retraining Program. It is designed to qualify an airman for award of an AFS or AFS shredout not in the normal progression pattern of a currently awarded AFS.

d. Lateral AFS Training. Lateral training is accomplished in an AFS where the designated input is from another AFS. Lateral AFS training, a planned part of the normal progression for certain AFSs, is shown in the career field charts of AFR 39-1, Airman Classification Regulation. Lateral training may be given either through formal courses conducted by ATC or through OJT programs conducted at the unit level. When lateral AFS training is given on the job, it is subject to the same controls as other OJT programs.

1-3. Dual Channel OJT Program:

a. General OJT Concepts:

(1) The Dual Channel OJT Program is based on the premise that there is, in career development, certain knowledge the airman must acquire in order to progress in the career field and to have the versatility required to move quickly from one kind of equipment or system to another, or from one position to another. Although this knowledge is related to, and concerned with, fundamental principles and theories, it is also involved with the development of job proficiency by the application of career area knowledge and the performance of the tasks associated with a specific job assignment.

(2) Dual channel OJT is a systematic, reportable application of self-study and the coach-pupil principle. The trainees acquire AFS knowledge by enrolling in and studying CDCs, when available, or by studying the references listed in the appropriate STS, if CDCs are not available. Trainees become proficient in their job by performing the tasks under supervision. This combination enables the airman, on reassignment, to perform the duties and or tasks to which he or she is assigned in another unit, after a period of qualification training.

(3) OJT is conducted in the actual work situation by designated personnel who are working in support of the unit mission. Even though the responsibility for conducting OJT is delegated to specific individuals, the overall OJT program is of concern to everyone assigned to the unit.

(4) OJT is an integral part of the unit mission. It requires vigorous support of commanders and supervisors at all levels. To be effective, an OJT program requires comprehensive planning, careful scheduling, timely implementation, capable direction, skillful application, and searching evaluation.

b. Career Knowledge Training. This part of training is administered under one of two methods, depending on the availability of CDCs (see chapter 7). You must use a CDC, if it is available (see paragraph 7-3). If neither a CDC or STS is available, command and local JPGs outline the specific knowledge requirements.

c. Job Proficiency Training. The job proficiency training part of the Dual Channel OJT Program is graphically depicted in figure 1-1. The following paragraphs describe the job proficiency training phase of the Dual Channel OJT Program (see figure 1-1).

d. Use of JPG.Immediate supervisors are responsible for the development, maintenance, and effective use of JPGs. JPGs are used to assist in developing the trainee's job proficiency. The JPG provides the airman with specific reference to an authoritative publication for each task performed in the current duty assignment. ATC adds specific references, including chapter and section numbers of technical orders or other references, as STSs are revised. This action avoids excessive required reading (see chapter 6 and figure 6-2).

1-4. Need for OJT:

a. OJT Background Development. Some Air Force jobs require less training. Most of the training for the less complex jobs is conducted at the unit level through OJT programs that include self-study and job proficiency training. For the more complex jobs, the ratio of the knowledge-to-skill requirements of the particular job determines the kind of training an individual selected for that job needs.

b. Training for AFSCs of Differing Complexity:

(1) For some complex AFSs, primary consideration must be given to the knowledge requirements. Since knowledge is most readily acquired in the classroom, it follows that most airmen selected for training into such jobs receive their initial training in formal technical schools.

(2) In other types of complex jobs, the greater emphasis must be placed on the requirements for skill; therefore, supervised training on-the-job is often the most practical way of producing competent personnel. A 3-skill or 5-skill level CDC provides the necessary career area knowledge. In other similar jobs where the requirements for skill and knowledge are nearly equal, some airmen are trained in technical schools and others receive their training on-the-job. Here, a 3-skill or 5-skill level CDC provides the necessary career area knowledge for the OJT trainee.

(3) After an airman has received appropriate initial job knowledge training, either in a formal school or on the job, he or she still must become thoroughly skilled in a duty position and have on-the-job experience. While airmen may become semiskilled as a result of either formal or on-the-job training, they must receive additional training on the job to become fully skilled workers.

1-5. Requirements for OJT. Requirements for awarding an airman AFS are set forth in AFR 35-1, Military Personnel Classification Policy (Officers, Warrant Officers, Airmen).

a. Normal Skill Progression. OJT, as it relates to normal skill progression, is depicted in figure 1-1. This figure illustrates normal skill progression in career knowledge and job proficiency parts of OJT. Use information on the various levels and type of OJT in the following paragraphs with figure 1-1.

(1) Helper to Semiskilled Level. Each helper 1-level airman receiving a directed duty assignment at the time of transfer from the basic military training center, is entered into UGT for the semiskilled 3-level AFS on reaching the new organization.

(2) Semiskilled to Skilled Level. The purpose of UGT from the semiskilled 3-level to the skilled 5-level AFS is to improve job performance and to increase skills beyond the levels acquired in formal schools or through 1- to 3-level UGT programs. With the exceptions listed in chapter 2, all semiskilled level airmen are entered into UGT (see figure 1-1). Semiskilled airmen who have not demonstrated an ability to progress are considered for other action according to chapter 2.

(3) Skilled to Advanced Level. Training from the skilled 5-level to the advanced 7-level may be entirely through UGT or through a combination of advanced for-

mal training and UGT, depending on the complexity of the career field and the formal courses available. With the exceptions listed in chapter 2, table 2-1, note 4 (paragraph 2-4 for ANG and AFRES personnel), enter semiskilled 3-level airmen in pay grades E-5 (in career ladders that don't have a skilled 5-level) and skilled 5-level airmen in pay grade E-5 into UGT for the award of the appropriate advanced 7-level AFS.

b. Training Capability. All of the OJT considered so far has been based on the assumption that the unit has the capability to accomplish the prescribed training. However, it is possible that local situations or temporary conditions may make realistic on-the-job training impractical or impossible.

(1) When a Training Capability Exists. In general, for a training capability to exist, there must be a CDC for the AFSC, or STS training references, and a person capable of administering job proficiency training. There are many misconceptions about the subject of training capability. The most prevalent one is the belief that the trainer must possess the same AFSC at the same or higher skill level in which the training is desired. Another belief is that to certify job proficiency, the person doing the certifying must be technically qualified to perform the function being considered. However, there must be some individual to certify job proficiency. EXAMPLE: A supervisor may certify job proficiency on a task, if the performance can be observed and verified by a technical order, manual, or other authoritative reference. Verification should make sure that proper procedures, tools, materials, and so forth are used and that the work, when completed, conforms to established standards.

(2) When Training Capability Is Questionable. If the presence of a training capability is questionable, all factors must be carefully weighed by a competent authority (appointed by the Chief, Personnel Division) possessing all of the facts. The Chief, Personnel Division, recommends approval of entry into training, if there is a training capability.

(3) When a Training Capability Does Not Exist. If it is determined that a training capability does not exist, the Chief, Personnel Division, sends a statement of the circumstances to the parent MAJCOM. The MAJCOM then takes action to provide a training capability.

c. Enrollment Into Formal UGT:

(1) Table 2-1 (table 2-4 for ANG and AFRES personnel) specifies who is entered into UGT when a training capability exists. Chapter 2 includes procedures for entering, withdrawing, or continuing airmen in training. C41

(2) Chapter 2 and AFR 39-4 contain policy on how to determine who is entered into or withdrawn from training and how to certify completion of upgrade and on-the-job retraining. Record the results of this training on AF Form 623, On-the-Job Training Record.

1-6. Where Formal UGT Is Conducted:

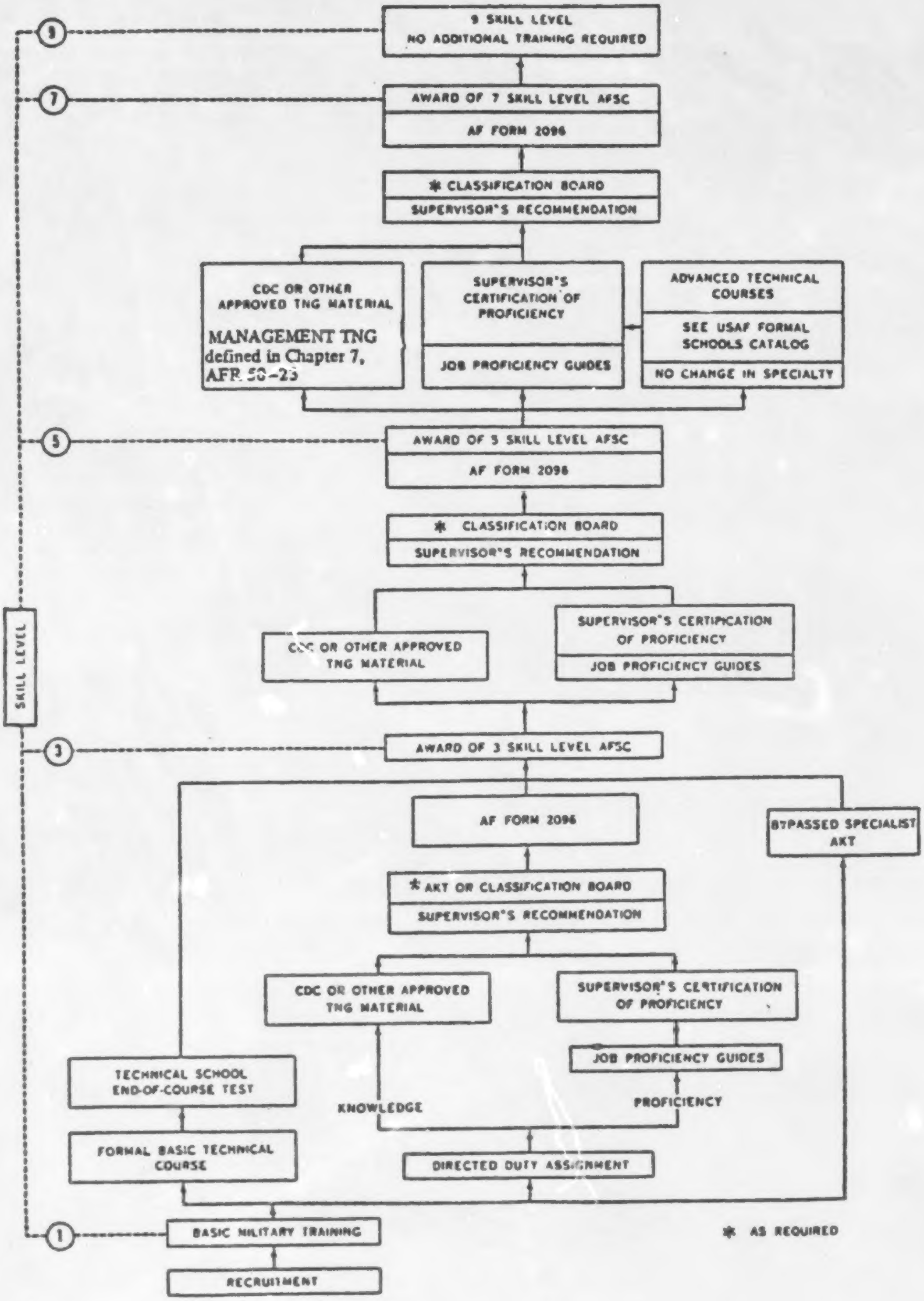
a. Unit Level OJT. Since the entire OJT program hinges on the learn-by-doing and self-study concepts, it follows that the part of the Dual Channel OJT Program, called job proficiency training, is normally conducted in the unit the airman is assigned to for duty. The responsibility for conducting the job proficiency phase of OJT is inherent in the job of each person, including civilians, who supervise the work of airmen. The responsibility for the career knowledge training part of OJT through self-study courses rests with the individual concerned. This training is monitored by the airman's immediate supervisor and the squadron OJT manager.

b. Job Proficiency Training:

(1) Job proficiency training implies practical application. It is the part of formal OJT that imparts skill. It places trainees in operational situations where they are assigned certain specific tasks that are part of their duty assignment. As the trainees acquire skill in the simpler tasks, they are assigned other tasks that are progressively more complex. In this way the trainees constantly broaden their skill and knowledge which ultimately includes all elements of the job.

(2) Learning in a job proficiency situation results from the close association between the trainee and the trainer. Understand however, that this coach-pupil method of training does not preclude short periods of informational group instruction on job proficiency training elements.

1-7. OJT and the Airman Career Program. OJT supervisors and trainers at all levels must understand the airman career program, if they are to perform effectively. While the supervisor's inherent responsibility is for planning an OJT program that outlines specific goals for the trainee to accomplish in the immediate future, his or her ultimate success depends to a large degree on the ability to advise new airmen of long range career opportunities. The supervisor must be thoroughly familiar with the specialty description of the individual concerned, as well as with the structure of the career field that the specific AFS is a part of. This information is contained in AFR 39-1. The supervisor must take an interest in the trainee's career and be able to trace the possible progress from entry into service to the pay grade of chief master sergeant in the particular career field involved.


9 SKILL LEVEL
NO ADDITIONAL TRAINING REQUIRED
AWARD OF 7 SKILL LEVEL AFSC
AF FORM 2096
✱ CLASSIFICATION BOARD
SUPERVISOR'S RECOMMENDATION
CDC OR OTHER APPROVED TNG MATERIAL
MANAGEMENT TNG defined in Chapter 7, AFR 50-23
SUPERVISOR'S CERTIFICATION OF PROFICIENCY
JOB PROFICIENCY GUIDES
ADVANCED TECHNICAL COURSES
SEE USAF FORMAL SCHOOLS CATALOG
NO CHANGE IN SPECIALTY
AWARD OF 5 SKILL LEVEL AFSC
AF FORM 2096
✱ CLASSIFICATION BOARD
SUPERVISOR'S RECOMMENDATION
CDC OR OTHER APPROVED TNG MATERIAL
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SKILL LEVEL
AWARD OF 3 SKILL LEVEL AFSC
AF FORM 2096
BYPASSED SPECIALIST AKT
✱ AKT OR CLASSIFICATION BOARD
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SUPERVISOR'S CERTIFICATION OF PROFICIENCY
JOB PROFICIENCY GUIDES
TECHNICAL SCHOOL END-OF-COURSE TEST
KNOWLEDGE
PROFICIENCY
FORMAL BASIC TECHNICAL COURSE
DIRECTED DUTY ASSIGNMENT
BASIC MILITARY TRAINING
RECRUITMENT
9
7
5
3
1
✱ AS REQUIRED

Figure 1-1. Skill Progression.

Chapter 2

SKILL-LEVEL ADVANCEMENT

SECTION A-SKILL-LEVEL ADVANCEMENT

2-1. Introduction to Skill-Level Advancement. This chapter tells when to enter airmen into on-the-job UGT for skill-level advancement. It outlines provisions to ensure that enough airmen are trained to fill qualitative force requirements. Section B applies to active duty airmen, and section C applies to all airmen assigned to Air Reserve Forces (ARF). Air Reserve Forces include personnel of the Air National Guard (ANG) and Air Force Reserve (AFRES) and individuals assigned as mobilization augmentees (MA) to Regular AF units.

SECTION B-ACTIVE FORCES

2-2. Determining Who Is Entered Into, Continued In, or Withdrawn From UGT:

a. When the capability exists to train an airman, enter him or her into training for the highest skill-level authorized for the trainee's grade (see table 2-1).

b. Evaluate each trainee's progress periodically (see table 2-2).

c. Refer to table 2-3 when a unit does not have a training capability or when an airman has demonstrated an inability to progress but has been recommended for additional UGT.

2-3. Completing On-the-Job UGT or Retraining:

a. Give all active duty airmen, who possess the potential and who are eligible for entry into UGT, sufficient training to qualify them for skill-level advancement in a reasonable period of time. Use table 2-2 to evaluate the progress of airmen during UGT and retraining to avoid keeping them in training status for excessive periods of time.

b. Airmen retrained into new AFSs are expected to complete retraining and qualify for award of the retraining in AFS at the skill level commensurate with their grade in the time limits prescribed in AFR 35-1.

c. Airmen who satisfactorily complete UGT or retraining requirements appropriate to their AFS do not automatically become eligible for skill-level advancement. The trainees must also satisfy the requirements of AFR 35-1 before they are awarded the next higher skill level in their career ladder. For example, airmen may complete UGT to the 7-skill level, but may not qualify for award of the AFS until they have completed a mandatory formal training course. On completion of training and classification policy requisites, airmen should be considered immediately for award of the appropriate AFS.

d. Airmen who fail to progress satisfactorily as shown by noncompletion of CDC assignments, substandard job performance, or failure of the course examination (CE) may be scheduled for additional supervised study. If training continues to be below standard, refer to table 2-3, rule 2 for required action.

SECTION C-AIR NATIONAL GUARD AND AIR FORCE RESERVE FORCES

2-4. Determining Who To Enter Into, Continue In, or Withdraw From UGT. When the training capability exists to train an airman, enter him or her into training for the highest skill-level authorized for the airman's grade, according to AFR 39-1 (see table 2-4). This requirement includes ANG air technicians and AFRES air reserve technicians. A Unit Manning Document (UMD) vacancy is not required. When an airman has demonstrated an inability to progress and has been recommended for additional UGT, refer to table 2-6.

2-5. Completing On-the-Job UGT or Retraining:

a. All airmen who possess the potential and are eligible for entry into UGT must be given sufficient training to qualify for skill-level advancement in a reasonable period of time. Use table 2-5 to evaluate the airman's progress during UGT and retraining to preclude retention of airmen in training status beyond the maximum training date.

b. An airman being retrained into a new AFS is expected to complete retraining and qualify for award of the retraining-in AFS at the skill level authorized for his or her grade in the time limits prescribed in table 2-5.

c. An airman who satisfactorily completes UGT or retraining requirements appropriate to his or her AFS does not automatically become eligible for skill-level advancement. On completion of training and classification policy requisites, the airman should be immediately considered for award of the appropriate AFS.

2-6. Supervisor's Evaluation (Table 2-5, Column B):

a. The supervisor's evaluation required by table 2-5, column B, is conducted by the trainee's immediate supervisor. The trainee (with training records) appears before the supervisor for evaluation. The supervisor reviews the training records and evaluates the trainee's progress in terms of timely completion of CDC study assignments and ability to complete assigned proficiency tasks. A record of this evaluation is made on an AF Form 623a, and both the supervisor and trainee sign and date the entry.

b. If this evaluation or any subsequent supervisory evaluation shows that the trainee is not satisfactorily progressing, he or she is referred to the commander for counseling and possible classification board action.

c. If continuance in training is recommended, airmen must be given sufficient assistance and training to qualify them for completion of training by the time indicated in table 2-5, column C.

2-7. Commander's Evaluation (Table 2-5, Column C):

a. The evaluation required by table 2-5, column C, is conducted by the unit commander or representative who must be knowledgeable in training directives and procedures.

(1) The trainee, together with the immediate supervisor, must appear before the commander for this evaluation.

(2) The commander evaluates the trainee's progression through examination of the training records. Areas to evaluate are the trainee's ability to respond to training, rate of progress, attitude, and the adequacy of training provided.

b. The commander records the findings and action taken as a result of this evaluation on the AF Form 623a. Both the commander and the trainee sign and date this entry.

2-8. Mandatory Classification Board (Table 2-5, Column D). The supervisor and trainer must be given the opportunity to appear before the classification board with the trainee.

2-9. Review Training (Table 2-7). All airmen failing to progress satisfactorily as evidenced by noncompletion of CDC assignments, substandard job proficiency during training periods (scheduled and equivalent training periods), VRE scores below 100, or failure of course examinations (CEs), must be scheduled for review training. Continued substandard performance necessitates action under the provisions of AFR 35-41.

TABLE 2-1

WHO IS ENTERED INTO UGT WHEN TRAINING CAPABILITY EXISTS - ACTIVE FORCES

R U L E	A	B	C	D
	If an airman is capable of UGT and possesses a control AFSC at the	**and possesses an awarded and control AFS in the same career ladder at the same level**	**and the career field ladder of the control AFS**	**and is assigned to a UMD position in the ladder of his or her control AFS, then enter in UGT for award of AFS at the (see note 1)**
1	1-level	yes		3-level (see note 2).
2	3-level	yes	has a 5-level	5-level (see notes 3 and 5).
3			does not have a 5-level, and is in grade E-5	7-level (see notes 4 and 5).
4	5-level	yes	has a 5-level, and is in grade E-5 or above	

NOTES: 1. The duty AFS of airmen who are surplus to total UMD authorizations is determined according to AFR 35-1.

2. Directed duty assignees (DDAs) and airmen reclassified to a 1-level primary and control AFS may be entered into UGT to the 3-level, on approval of the classification board approving authority.

3. Trainee's duty AFS is identical to the authorized manning document position against which he or she is officially assigned.

4. The following categories of personnel are not required to enter into upgrade training to the 7-skill level unless they want to. Airmen already entered into upgrade training who are in categories a, b, or c below must be told that they may be removed from upgrade training at their request.

a. Airmen who have signed a PCS declination statement and are within 6 months of date of separation (DOS).

b. First-term airmen who decline 7-skill level training. Those who decline must sign the following statement: "Eligibility for 7-skill level UGT was explained and I decline training. I know I must have a 7-level for E-6 promotion consideration. On request and with concurrence of my commander, I can enter training at a later date." Include this statement on the AF Form 2096 and file it in the airman's unit military personnel records.

c. Career airmen who have an approved retirement and are within 12 months of separation.

★5. Phase II medical students enrolled in courses J5AZ090350-001, J5AZ090450-000, J5AL090431-001, and J5AL091630-001 are in approved formal school training programs and are not in UGT as defined by this publication. The first unit of assignment prepares AF Forms 623 for these students after completion of the course. Use Training status code "L" for trainees in courses AZ090350 and AZ090450 (school awards 5-skill level) and TSC "K" for trainees in courses AL090431 and AL091630 (school awards 3-skill level). After graduation, enter them into TSC "R". Any of these students promoted to pay grade E-5 should be encouraged to voluntarily enroll in applicable CDCs and management training by correspondence. However, they should not be entered in 7-skill level UGT until assignment to their first permanent duty station. MAJCOMs may credit time spent in Phase II training in pay grade E-5 toward the demonstrated proficiency requirement listed in AFR 35-1.

***TABLE 2-2**

EVALUATION OF PROGRESS - ACTIVE FORCES

R U L E	A	B	C
	If airman has not completed training and is in	**then first evaluation is by the commander who evaluates the airman's progress not later than (see notes 1, 2, 4, and 5)**	**and final evaluation is by a personnel classification board not later than (see notes 1, 3 and 5)**
1	normal UGT to the 3-level	9th month of training	12th month of training
2	retraining to the 3-level		
3	normal UGT to the 5-level	15th month of training	18th month of training
4	retraining to the 5-level	12th month of training	15th month of training
5	normal UGT to the 7-level	20th month of training	24th month of training
6	retraining to 7-level	15th month of training	18th month of training

NOTES: 1. Periods of leave, TDY to a unit without a training capability, hospitalizations, permanent change of station (PCS) travel, temporary details, temporary personal reliability program (PRP) disqualification under the commander's option program, or any interruptions of training (which do not warrant removal from training under table 2-3), are recorded by the supervisor on the AF Form 623a, On the Job Training Record-Continuation Sheet. These periods are not considered against maximum time permitted to complete training. Training dates should be adjusted when it is beneficial and necessary to provide additional training time. Use AF Form 2096 to adjust the date the airman entered training and to report the change in the PDS. On receipt of AF Form 2096 adjusting the date entered training, the supervisor enters the adjusted date entered training and the new estimated training completion date on AF Form 623. Next, the supervisor uses table 2-2 to compute the new evaluation dates on AF Form 623, section I, and enters the new computed (adjusted) dates. If the trainee arrives with an overdue evaluation, the gaining unit performs evaluation within 60 days after the date the trainee arrived at the station.

2. Commanders determine whether an airman should be continued in training or withdrawn. If recommended for more training, the additional training should not be more than the limits prescribed in table 2-2, column C. If removal from UGT is recommended, refer to table 2-3, rule 2.

3. Periods of time represented in column C are maximum training periods. Major commands are authorized to review exceptional cases and permit additional training, if warranted. If removal from UGT is recommended, refer to table 2-3, rule 2. Send requests for extension of maximum training time from the CBPO to the MAJCOM. Include AF Form 623 and copies of the last two Airman Performance Reports (APRs) with the request. Trainees approaching maximum training periods should be evaluated by personnel classification boards 30 days prior to maximum training dates. This action is necessary to allow MAJCOMs to finalize board proceedings before allotted training times expire.

4. Enter a record of these evaluations (column B) on the AF Form 623a. Areas covered include, but are not necessarily limited to:

a. Problem areas and action taken to correct these areas.
b. Attitude of trainee toward his or her training program.
c. Recommendation to continue or remove the trainee from UGT.

Also enter the date that the evaluation was conducted. The evaluator and trainee sign the entry.

5. Personnel who reach the time limits in column B are considered to be in overtime training. Personnel who reach the time limits in column C are considered to be in excessive training. See attachment 1 for a complete definition of the two terms. No other terms are authorized to describe individuals who reach these points in the progression of their training. Commands may identify personnel reaching column B or C earlier as a management tool to track progress; however, they must refer to them as "1 month from overtime" or excessive, as the case may be.

TABLE 2-3

WHO IS WITHDRAWN FROM OR NOT ENTERED INTO UGT - ACTIVE FORCES

RULE	A	B	C	D	E	F
	If airman	and is recommended for additional UGT	and unit of assignment has UGT capability	and airman possesses an awarded and control AFS in the same career ladder as the duty AFSC	then remove from or do not enter into UGT	and reassign to a unit with UGT capability
1	is not qualified for retention of present AFS				X	
2	has demonstrated a lack of ability to progress	NO	YES		(see note 1)	
3	is qualified for UGT	YES	NO		X	X (see note 2)
4	is assigned duty out of his or her training AFS for more than 30 days		YES		X (see note 3)	
5	is a DDA with a 1-level primary AFS		NO		X	X (see notes 2 and 4)
6	is eligible for training to the next higher skill level	NO	YES	YES	X (see note 5)	
7	has approved discharge and pending separation				X	

NOTES: 1. An airman recommended for withdrawal from training for failure to progress is processed according to either a, b, or c below.

a. If the commander, supervisor, and trainer recommend withdrawal from training and justification is reflected on AF Form 2096, and the base OJT supervisor and trainee concur with withdrawal from training, the CBPO chief may approve either withdrawal and continuation in the airman's present AFS or return to a previously awarded AFS, or may initiate a request for retraining under AFR 39-4. Enter the following statement in the remarks section of AF Form 2096 and have the trainee sign it: "I understand my right of appeal by classification board action and waive that right. I have been briefed on my promotion status while withdrawn from training. I further understand that removal from training based on failure to progress may result in separation under the provisions of AFR 39-10, Separation Upon Expiration of Term of Service for Convenience of Government, Minority, Dependency and Hardship, paragraph 3-8i, or AFM 39-12, Separation of Unsuitability, Unfitness or Misconduct; Resignation or Request for Discharge for the Good of the Service, and Procedures for the Rehabilitation Program, paragraph 2-4a or 2-4c."

b. If either the trainee, commander, or CBPO chief does not concur with the withdrawal from OJT, the airman will be scheduled to meet a classification board. The board will recommend that the airman be:

(1) Continued in present AFS. If the board believes that he or she does possess the potential for future advancement, the airman is reentered into training at the commander's discretion; however, the individual must demonstrate through self-improvement efforts that he or she is qualified for additional training. Commanders should evaluate these individuals at Least 90 DAYS to determine their eligibility for reentry into upgrade training. Enter results of this evaluation on AF Form 623a.

(2) Retrained into another AFS, under AFR 39-4, for which better qualified.

(3) Returned to a previously awarded AFS, if applicable.

(4) Continued in training.

c. If appropriate, the airman will be considered by the commander for separation from the Air Force according to AFR 39-10 or AFM 39-12.

2. Column F is not authority for waiver of dislocation allowance or other PCS restrictions of AFR 39-11, Airman Assignments.

3. If assignment is more than 90 days, the airman must be returned to duty immediately and reentered into training in the control AFS or recommended for retraining under AFR 39-4, whichever is appropriate.

4. Directed duty assignees who cannot be entered into UGT in their control AFS may be considered for another AFS, according to AFR 39-4. If reassignment is not appropriate, such training must be in the aptitude area of their enlistment.

5. When an airman has demonstrated marginal or substandard performance or has shown a lack of supervisory ability, the commander may direct that the airman not be entered into UGT for the award of the next higher skill level. In such cases, the reason for not being entered into training is explained and the airman is advised of action necessary to qualify for entry into training at a later date.

TABLE 2-4

WHO IS ENTERED INTO UGT WHEN A TRAINING CAPABILITY EXISTS - ANG/AFRES

R U L E	A	B
	If an airman	**then the**
1	has completed basic military training only, but no technical school	CBPO-OJT unit enters the airman ino 3-level UGT.
2	has completed BMT and subsequent technical school training	CBPO-OJT unit enters the airman into 5-level UGT.
3	has been awarded the 3-level AFSC	Section supervisor enters the airman into 5-level UGT. When no 5-level AFSC exists, qualified airmen will be entered into 7-level UGT (see notes 1, 2, 3, and 4).
4	has been awarded 5-level AFSC and holds grade E-5 or above	Section supervisor enters the qualified airman into 7-level UGT (see notes 1, 2, 3, and 4).
5	is retraining	Gaining section supervisor enters the airman into appropriate level UGT, as prescribed in AFR 35-1.

NOTES: 1. Airmen to be placed on UGT for the 7-level will be in grade E-5 or above.

2. Airmen may be placed on UGT to the 7-level, providing the training capability exists. (See paragraph 1-5b for definition of training capability.)

3. Care must be taken in the selection to ensure that only those airmen potentially capable of advancement to the 7-skill level are entered into training (see AFR 35-1).

4. First-term staff sergeants who decline 7-skill level training must sign the following statement: "I decline 7-skill level training. I know I must have a 7-level AFSC for promotion to E-6 and will not normally be allowed to occupy a 7-level UMD position. Upon request and with concurrence of my commander, I can enter training at a later date." Include this statement in AF Form 2096 and file it in the airmen's unit military records.

TABLE 2-5

EVALUATION OF PROGRESS - ANG/AFRES

R U L E	A	B	C	D
	If airman has not completed training and is in	**then first evaluation is by supervisor who counsels the trainee no later than (see notes 1, 2, and 5)**	**and second evaluation is made by the unit commander no later then (see notes 3, 5, and 6)**	**and final evaluation is made by a classification board no later than (see notes 4 and 5)**
1	normal UGT or retraining to the 3-level	9th month of training	12th month of training	18th month of training.
2	normal UGT or retraining to the 5-level	12th month of training	18th month of training	24th month of training
3	normal UGT or retraining to the 7-level	14th month of training	20th month of training	26th month of training.

NOTES: 1. Periods of absence, temporary details, or any combination of these that cause interruption of training for an entire training period (4 hours or more), which do not warrant removal from training under table 2-6, will be recorded on an AF Form 623a to justify possible future adjustments of training date. When an individual has missed four or more training periods, the period of upgrade training or retraining may be adjusted accordingly. Missing a combination of 2 complete days of training is considered justification for a 30-day adjustment. An individual who does not attend an active duty training tour may have his or her training date adjusted by 5 months. When a supervisor determines that an adjustment of a trainee's date entered training is warranted due to reasons other than those listed above, a complete history of the unique circumstances will be forwarded to HQ AFRES/DPT, Robins AFB GA 31098, for consideration.

Ch 1

a. When an individual is unable to receive proficiency training due to lack of a security clearance, his or her period of upgrade training or retraining may be adjusted for a total period of delay involved in receipt of security clearance.

b. The supervisor initiates an AF Form 2096 to request adjustments

(Notes continued on next page.)

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of "date entered training," normally within 30 days of the date on which the trainee will reach the time limits of column C above. Adjustments will not be made each time an event occurs, but will be for the cumulative total of all interruptions to training which warrant adjustments. The remarks section of AF Form 2096 contains the justification for the adjustment and must be substantiated by the appropriate entries contained on AF Form 623a, as required above.

c. Periods of TDY in excess of 30 days at a station which has no training capability will not be counted against the OJT completion dates.

2. Airmen who have not completed training within this time limit will be counseled by their supervisor, using the guidelines in paragraph 2-6.

3. Airmen who have not completed training within this time limit will be counseled by their commander, using the guidelines in paragraph 2-7.

4. Airmen who have not completed training within this time limit will be required to appear before a classification board. Board findings will be processed under the guidelines and procedures in AFR 35-1.

5. These times will be doubled for trainees assigned to training category "B" positions.

6. Personnel who reach the time limits in column C are considered to be in overtime training. Personnel who reach the time limits in column D are considered to be in excessive training. See attachment 1 for a complete definition of the two terms. No other terms are authorized to describe individuals reaching these points in the progression of their training. Commands may identify personnel reaching column C or D earlier as a management tool to track progress; however, they must refer to them as "1 month from overtime" (or excessive), as the case may be.

TABLE 2-6

WHO IS WITHDRAWN FROM OR NOT ENTERED INTO UGT - ANG/AFRES

	A	B	C	D	E
RULE	If airmen	and is recommended for additional UGT	and the unit of assignment has UGT capability	and airman possesses an awarded and control AFS in the same career ladder commensurate with his or her grade	then remove from or do not enter the airman in UGT
1	is not qualified for retention of his or her present AFS		yes		X ~~(see note 1)~~
2	has demonstrated a lack of ability to progress	X (see notes [illegible], 2. and 4)			
3	is eligible for UGT	no		yes	X (see note 4)
4		yes	no	no	X (see notes [illegible] 2, and 5)
5			yes	yes	X (see notes 3 and 4)

Ch 1
Ch 1
Ch 1

2. An airman recommended for withdrawal from training for failure to progress will be given the opportunity to appear before a classification board, whether he or she concurs or nonconcurs. The board will recommend that the airman be:

a. Continued in present AFSC. If the board believes the airman does possess a potential for future advancement, he or she is reentered at the commander's direction.

b. Retrained into another AFS for which better qualified.

c. Returned to a previously awarded AFS, if applicable.

d. Continued in training in present AFS.

3. First-term staff sergeants who decline to continue 7-skill level training must sign the following statement: "I decline to continue 7-skill level training. I know I must have a 7-level AFSC for E-6 promotion and will not normally be allowed to occupy a 7-level UMD position. Upon request and with concurrence of my commander, I may enter training at a later date."

4. When a staff sergeant has a valid hardship, has demonstrated marginal or substandard performance, or has shown a lack of supervisory ability, the commander may direct nonentry into or withdrawal from UGT for award of the 7-skill level. In such cases, the reason for nonentry into or withdrawal from training is explained and the airman is advised of action necessary to qualify for entry into training at a later date. An entry will be recorded by the commander on the AF Form 623a to substantiate nonentry or withdrawal from UGT.

5. In those units where no 7-level UMD position exists and training capability is limited or nonexistent, unit commanders may elect not to enter staff sergeants into 7-level UGT by processing an AF Form 2096, placing the airman in training status code "Q". An appropriate explanatory note will be placed on the AF Form 2096.

TABLE 2-7

WHEN TO CONDUCT REVIEW TRAINING - ANG/AFRES

RULE	A	B	C
	If the trainee (nonprior or prior service)	then conduct review training that includes	and evaluate the training by
1	scores less than 100 percent on any volume review exercise (VRE)	reviewing the missed questions and content area listed on ECI Form, Report of VRE during the training program (see note 2)	oral or written tests on the missed questions during the UTA. Certify review training on ECI Form, Report of VRE.
2	fails the course examination	reviewing the CSRG areas listed on ECI Form CE, which are correlated with the CE test items, during 2 hours of supervised study following receipt of ECI Form CE (see notes 1, 2 and 3)	readministering the Course Examination.
3	fails course examination upon retake		reenrolling or scheduling for classification board. Trainees are allowed only one reenrollment.
4	fails the AKT	training until the supervisor and unit commander are satisfied the airman is progressing satisfactorily (see notes 1, 2, and 3)	readministering the AKT when eligible.
5	fails AKT upon retake		scheduling for classification board in accordance with AFR 35-1, chapter 6.
6	has been terminated from CDC	reenrollment in appropriate CDC with concurrence of unit commander	satisfactory completion of the course.
7	is having difficulty understanding material or performing tasks	conducting formal classroom instruction or reviewing training material in a group study class during the training period	having the trainee complete the applicable VRE, SR or tasks.
8	has not been upgraded within the time limits prescribed by table 2-5, column C. (Commander's evaluation)		administering the CE or AKT as soon as eligible.

Ch 1 Optional for CWE personnel

NOTES: 1. Commanders will schedule an additional 2 hour supervised study immediately following the second period of the Saturday and Sunday training period.

2. The trainee's supervisor will attend post training period review training sessions with the trainee to provide assistance with training problems. In cases where there is more than one trainee with the same AFSC, one supervisor may be selected to provide technical assistance for all the trainees in his or her specialty.

3. Not applicable for MAJCOM and SOA MAs.

Chapter 3

CONTROL FOR OJT

3-1. Controls and Directives. Control documents established to ensure a proper balance in personnel training include this regulation, the program technical training (PTT), AFR 35-1, and AFR 39-4. NOTE: AFR 39-4 is not applicable to ANG and AFRES Forces.

3-2. Program Technical Training (PTT). The overall Air Force technical training program is published periodically in United States Air Force (USAF) program technical training documents, referred to simply as the PTT. The PTT is the mission directive for accomplishing military and technical training. It outlines a 3-year planned division of training between formal schools and command OJT programs for helper level to semiskilled level airmen. Each AFS is identified by training priority category, the number of airmen to be trained in formal schools, and the number to be trained through command OJT programs. The commands which conduct formal training courses use the PTT to determine the training and housing facilities required to support their training loads. Other commands use the PTT to estimate the nature and scope of the OJT programs that they will require.

3-3. AFR 35-1, Military Personnel Classification Policy (Officers, Warrant Officers, Airmen):

a. Directed Duty Assignments (DDAs). Based on existing and projected specialty requirements, USAF assigns certain groups of airmen to duty in a particular specialty. This system of controlled, directed duty assignments, ensures that airmen are used in the AFS for which they are trained or for which it is determined they are best suited and may serve the interests of the Air Force. Diverting airmen from DDAs is not authorized except as provided in AFR 39-4. Therefore, airmen in directed duty assignments must not be used outside of their control AFSC until all other possible assignment actions have been taken.

b. Major Categories of DDAs. DDAs involve three major categories of airman personnel:

(1) New Enlistees. This DDA category concerns new enlistees who have aptitudes for required specialties, but for whom formal training is impractical. They have demonstrated aptitudes for required specialties for which no formal training courses exist, or for which the initial training responsibility is divided between formal courses and command OJT programs. On arrival at their assigned units, these airmen are placed into 3-level UGT for their assigned specialty. The control AFSC for these airmen is the 1-level AFSC in which they are training.

(2) Airmen With Previous Service. This category involves recalled airmen, airmen who enlist after a break in service, and enlistees with prior active service in other military services who are assigned directly to a duty station by the USAF Recruiting Service. These airmen are normally assigned to the specialty indicated on the DD Form 4, Enlistment or Reenlistment Agreement - Armed Forces of the United States.

(3) Bypassed Specialists. As specified in AFR 35-1, bypassed specialists are airmen who, because of previous military or civilian training or experience, are awarded the semiskilled level of an AFS.

3-4. AFR 39-4, Airmen Retraining Program. Refer to AFR 39-4, chapter 2 for voluntary and selective retraining and lateral training procedures, and to chapter 4 for information concerning the Air Force Dual Qualification and Identification Program (CONUS and Oversea Imbalance).

3-5. Quality Direction and Control:

a. Air Force Policies and Procedures. In addition to the controls already discussed, Headquarters USAF maintains quality controls. Without some methods of recording training, individual units would tend to duplicate the training already received by airmen. This would be especially true when airmen transfer from one MAJCOM to another. Since all upgrade training, lateral training, and retraining conducted on the job is intended to result ultimately in the award of an AFSC, MAJCOM requirements for a duty position of the specialty must conform to overall Air Force standards for the specialty concerned. Commanders must not establish policies, procedures, or restrictions that conflict with these controls. To achieve uniformity, established aids are available to commanders.

b. AF Form 623, On-the-Job Training Record. Chapter 10 contains instructions for completing AF Form 623. This form contains a comprehensive record of AFSC oriented training.

c. Reassignment of Trainees. Airmen who are reassigned while in official upgrade training status hand-carry CDC materials such as course volumes, volume review exercises, answer sheets, and study reference guides to their new station. The course examination (CE) is mailed separately to the appropriate testing official. In addition to establishing physical checks to ensure proper clearance, squadron OJT managers counsel CDC students on the importance of retaining their materials during travel to the new station. CDC materials must be with all other training materials and records applicable at the time of processing for departure. The losing organization encloses a copy of the permanent change of station (PCS) orders in the correspondence and sends training materials to the gaining organization when they arrive after a trainee's departure (see table 4-4). The gaining organization sends a change of address (ECI Form 17, Student Request for Assistance) to the Extension Course Institute (ECI) on the airman's arrival at the new station (see table 4-4).

d. Training Folder for OJT Trainees in TDY Status.

Airmen placed in a TDY status to a unit with a training capability hand-carry their AF Form 623 (along with their CDC and other appropriate training materials), if the TDY is projected to continue for 30 days or longer. If the airman goes TDY to a unit that does not have a training capability, the periods of time while on TDY are not counted against the airman's maximum allowable training time.

(1) When an airman arrives at his or her TDY unit, the trainee turns AF Form 623 and other training materials over to the immediate supervisor. This supervisor then becomes responsible for maintenance of the AF Form 623 during the period the airman is assigned and must annotate the form to indicate the training received by the trainee during this period. UGT continues when trainees are on periods of TDY to units that have a training capability. The TDY unit of assignment is responsible for appointing an individual to serve as the trainer for the TDY airman.

(2) At the end of the TDY period, the airman must return his or her AF Form 623 and other training materials to the parent organization. The record will reflect the training provided during the period of TDY. NOTE: Bulk shipment of training records is authorized (optional) for groups of individuals and unit deployments. An individual who is part of the deployment (training technician where possible) is assigned responsibility for the records.

3-6. AF Specialty Training Standards (STSs):

a. Description of STSs. STSs are the official Air Force specifications for training. They describe an AFS in terms of the tasks or knowledge that airman in that specialty are required to perform or know on the job. STSs correlate to and expand the AFS descriptions contained in AFR 39-1. An STS is a generalized, AFS-oriented document, which is a printed breakdown of an AFS into various tasks and knowledges. The fact that significant AFS elements are reflected does not mean that supervisors are bound to gear job proficiency training programs to cover all STS elements.

b. Requirements Indicated by STS. Minimum qualitative requirements for holding an AFSC are provided in columns 2A, 3A, and 4A of attachment 1 to the STS. Task performance requirements are indicated by code key numbers 1 through 4. Task knowledge requirements are indicated by code key lower case letters a through d. Subject knowledge requirements are indicated by code key upper case letters A through D. When a trainee can perform Job Proficiency Guide (JPG) tasks to the level indicated, he or she satisfies the task performance requirements as discussed in chapter 6.

3-7. OJT Advisory Service. OJT Advisory Service provides professional knowledge and assistance to support a standardized and aggressive OJT program. If an OJT advisor is available at your installation, schedule services with the CBPO OJT manager. If an OJT advisor is not available, the CBPO OJT manager requests the needed service from the MAJCOM OJT functional manager.

a. Type "A" OJT advisory service assists a command, a numbered Air Force, an air division, or a wing in assessing its OJT requirements and in planning an OJT program on an agency-wide basis.

b. Type "B" OJT advisory service assists commanders at all levels in planning OJT programs for specific specialties or career fields.

c. Type "C" OJT advisory service provides the following professional knowledge:

(1) OJT Trainer Orientation Course (4AJF75000-001, 24 hours). Designed to train personnel in the skills and knowledge necessary to perform as trainers in the OJT program. Highlights of this course involve practical application of training principles and techniques, to include evaluation procedures. (Recommended for first termers and a must for those supervisors who also perform trainer duties.)

(2) OJT Manager/Supervisor Orientation Course (4AFJ75000-002, 24 hours). Designed to train managers and supervisors in the skills and knowledge necessary to manage an aggressive OJT program. Practical application involving developing an OJT program, JPG development and documentation, and a supervisor's evaluation are highlights of the course.

ch 1 (3) OJT Trainee Orientation Course (4AJF75000-003, 4 hours). Designed to acquaint the new Air Force OJT trainee with the purpose of the OJT program. Scope of training includes the role of OJT in the Air Force, skill level advancement, and specific OJT responsibilities. (Recommend trainee attend within the first 3 months of OJT - consider scheduling during introduction program.)

ch 1 (4) [illegible] OJT Managers Orientation Course (4AJF75000-024, 24 hours). Assists commanders by making sure selected personnel can adequately manage a unit training program. Graduates of this course will be capable of assisting supervisors in assessing training needs, will be capable of performing a viable staff assistant visit (SAV), and initiating a valid SAV report.

(5) Commander/Staff Officer OJT Orientation Course (4OJF7500-008, 4 hours). A fast paced course designed to update these personnel on the OJT program, emphasizing the importance of managing an aggressive OJT program. (Officers and senior NCOs in staff positions may attend; recommend previous attendance of the Manager/Supervisor course.)

(6) Air Reserve Forces (ANG/AFRES), OJT Trainer/Supervisor Orientation Course (4AJF75000-015, 14 hours). Designed to train Reserve and Air National Guard Supervisors of Air Force activities and those who conduct the actual training. Highlights of this course involve developing a Reserve Forces' OJT program, performing progress evaluations, documenting the JPG along with covering training principles and techniques.

***3-8. Applying ISD to Proficiency/Qualification Training Channel of OJT.** AFM 50-2 describes a step-by-step process for developing training programs. It primarily addresses the development of formal resident training programs, however, chapter 10 briefly discusses the application of the IDS process to OJT programs. Attachment 8 of this regulation provides more detailed guidelines for the application of ISD in OJT. Additionally, AFP 50-58, also contains information of value to personnel responsible for developing training programs.

Chapter 4

DUTIES AND RESPONSIBILITIES FOR OJT

4-1. General Responsibilities. The logical first step in planning an OJT program is to outline the responsibilities of each level of operation. This is the basis for establishing specific duties at each level and for identifying the individuals who perform such duties. Commanders, personnel officers, training managers, and supervisors at all levels have a continuing, inherent responsibility to ensure that OJT is conducted as effectively as possible. A sound OJT program is an integral part of the primary mission of every organization to which airmen are assigned. Every individual from commander to trainee must accept and discharge OJT responsibilities as specified here. This chapter provides a list of duties and responsibilities for each level of a typical Air Force organization.

4-2. Responsibilities Related to Organizational Structure. Figure 4-1 represents a wing or base organization and lists the duties and responsibilities that apply to an actual organization. While the organizational structure shown may not apply specifically to all commands, the responsibilities listed are sufficient to serve either as a guide or checklist for establishing responsibilities at the various levels in any type of Air Force organization. Table 4-1 provides information regarding the responsibilities of major commands in the management of their OJT programs.

4-3. Commander's Responsibilities. Responsibility for an effective OJT program rests with commanders at all echelons. The commander who insists on and takes an active part in an effective OJT program is taking an important step toward ensuring the continued accomplishment of both his or her mission and the total Air Force mission. Responsibilities which logically rest with the commander are in table 4-2.

4-4. Servicing Consolidated Base Personnel Office (CBPO) OJT Manager. The NCOIC, CBPO-OJT unit is responsible for staff supervision of all the OJT programs within units serviced by the CBPO. He or she plans, organizes, and directs the overall OJT program, ensuring that equal service is given to all units (host and tenant) for which he or she is responsible. These duties and responsibilities are outlined in table 4-3. Since the training technicians in the OJT unit have responsibility for the base-wide OJT program and the computer directed training system (CDTS), they will not be assigned the duty of squadron OJT manager, CBPO in-house training manager, computer assisted instruction (CAI) monitors, or other duties not specifically related to the On-The-Job Training Program.

4-5. Group, Squadron, or Detachment OJT Manager. Group, squadron, or detachment commanders appoint an OJT manager to supervise the unit OJT Program. Duties and responsibilities of the Squadron or Detachment OJT manager are listed in table 4-4. When group or squadron commanders do not have control over all functional areas of the unit (such as in headquarters squadron section), a staff level OJT supervisor is appointed for each staff activity not under the immediate control of the commander. When staff agency OJT supervisors are appointed, they assist in performing the OJT manager duties as determined by the unit commanders. Appointment of staff level OJT supervisors does not eliminate the requirement for a squadron OJT manager. NOTE: MAJCOMs or separate operating agencies may make the staff agency OJT supervisor optional, if the authorized enlisted strength for that function is less than 25 and a training technician (AFSC 751X2) is assigned as the squadron OJT manager.

4-6. Immediate Supervisor. Responsibility for conducting OJT is inherent in the position of all supervisors. Since the supervisor (military or civilian) has daily contact with all the personnel assigned to the unit, the supervisor occupies a key position in the OJT program. In smaller sections, the immediate supervisor may also be the trainer. In any case, the title, immediate supervisor, is applicable to that person who maintains OJT records and forms and is responsible for those duties and responsibilities contained in table 4-5.

4-7. Selection of OJT Trainers. Ideally, the OJT trainer is the trainee's immediate supervisor. However, for various reasons this may be difficult to arrange in some organizations. As a result, trainers may be appointed to provide training for individuals or small groups of trainees. Appoint trainers who have broad fundamental knowledge and technical know-how, as well as the ability to get along with people and inspire the confidence of the trainees. The trainer is not to be thought of as an individual assigned to full-time instructional duty, but rather a skilled worker who is assigned to a production job. Duties and responsibilities of the OJT trainer are shown in table 4-6.

4-8. Relationship of Trainer to Trainee. The on-the-job trainee needs motivation. Motivation stems from a felt need. The trainee should feel the need for OJT when the immediate supervisor accomplishes the requirements of AF Form 623, section II. The trainee must understand the need, the objectives, and the procedures of OJT, as well as his or her responsibility to accept and perform training assignments to the best of his or her ability. Table 4-7 lists only a few of the broad responsibilities of trainees. The supervisor or trainer has to adapt orientation procedures to each situation to make clear to the trainee his or her responsibility.

4-9. Base CE Testing Offices Responsibilities. Table 4-8 specifies the responsibilities inherent in base CE testing offices.

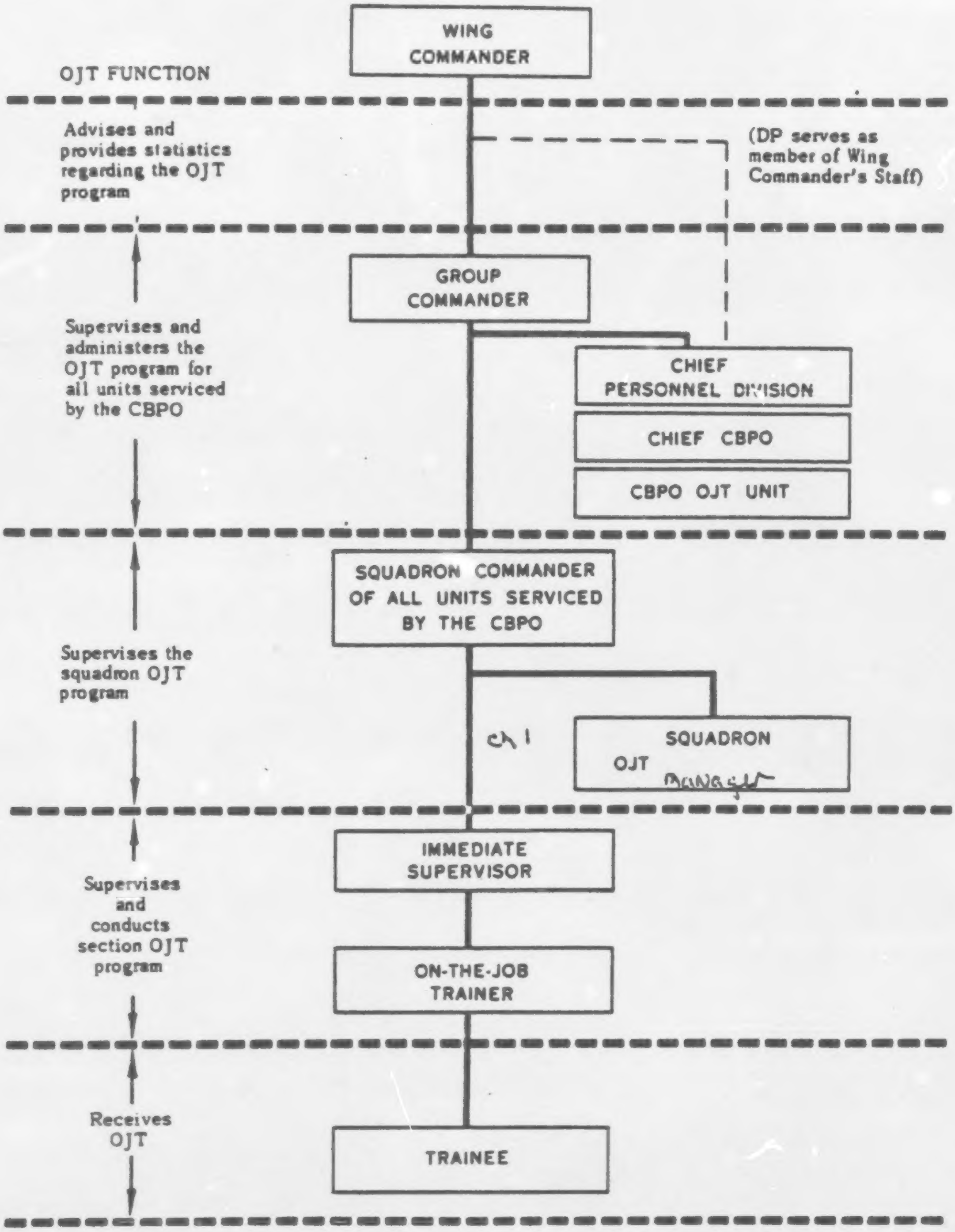
WING COMMANDER
OJT FUNCTION
Advises and provides statistics regarding the OJT program
(DP serves as member of Wing Commander's Staff)
GROUP COMMANDER
Supervises and administers the OJT program for all units serviced by the CBPO
CHIEF PERSONNEL DIVISION
CHIEF CBPO
CBPO OJT UNIT
SQUADRON COMMANDER OF ALL UNITS SERVICED BY THE CBPO
Supervises the squadron OJT program
ch 1
SQUADRON OJT manager
IMMEDIATE SUPERVISOR
Supervises and conducts section OJT program
ON-THE-JOB TRAINER
Receives OJT
TRAINEE

Figure 4-1. The Function of OJT in a Typical Wing/Base Organization.

TABLE 4-1

DUTIES AND RESPONSIBILITIES OF MAJOR COMMANDS, NATIONAL GUARD BUREAU, AND SEPARATE OPERATING AGENCIES (see note 1)

DUTY	A	B
	Major command's responsibilities in management of command OJT are to (see table 4-2)	Applicable Directives
1	ensure the implementation and execution of Air Force OJT policies and procedures.	AFR 50-23
2	effectively manage the data elements in the Advanced Personnel Data System (APDS) that support their OJT programs.	AFR 50-23, AFM 30-3, Vol II
3	determine Command OJT requirements, and, if appropriate, request Air Force Directives be revised to meet these requirements.	AFM 30-130
4	actively promote professional development of the command OJT program through periodic staff assistance visits and conferences.	AFR 50-23, AFR 35-33
5	furnish command policy and guidance on OJT and direct the command on-the-job training program.	AFR 35-33
6	provide guidance to command functional staffs and training counterparts of other major commands on planning, organizing, developing, and implementing command unique OJT program requirements.	AFR 50-23
7	perform as MAJCOM functional manager for all programs affecting personnel in AFSCs 751X2/93.	
8	review requests for extension of OJT time and authorize additional time if warranted (table 2-2 or 2-5)	
9	monitor CBPO annual staff visit reports and take direct appropriate corrective action when necessary (see note 2).	
10	provide guidance to CBPO-OJT units on management and control of CDC examinations and operation of the mandatory CDC-CE Testing Office.	
11	monitor the review and coordination of each tentative Specialty Training Standard.	AFR 8-13, AFR 50-23
12	monitor the command Computer Directed Training System (CDTS) program.	AFM 50-108

NOTES: 1. Chief, Air National Guard will assume the responsibilities of a major commander for Air National Guard units.
2. ANG units furnish the report of visit to unit commander only.

TABLE 4-2

COMMANDER'S RESPONSIBILITIES

DUTY	A Commanders at all levels are responsible for	B Applicable Directives
1	Accepting OJT as an integral part of their mission.	AFR 39-4, AFR 50-23
2	implementing the policies and procedures established by Air Force directives, as supplemented.	
3	issuing appropriate directions outlining specific responsibilities and procedures for HQ USAF approved supplements to this regulation.	AFR 10-7, AFM 30-3, vol II or VI, AFR 5-1, AFR 50-23, AFM 30-130
*4	assigning qualified personnel to manage and supervise the OJT programs. Due to the importance of training to the unit mission, the NCO appointed as the squadron OJT manager should be assigned no duties that do not relate directly to training programs. In those cases where the job of the squadron OJT manager is a non 751X2 person, NO other duties should be assigned to that NCO other than those that relate to his or her control AFSC.	AFR 35-1, AFR 50-23
5	indoctrinating all subordinate personnel relative to the importance of effective OJT in accomplishing both the unit and Air Force missions. Assure unit OJT managers conduct informal visits to each duty section between scheduled semiannual visits.	AFR 50-23
6	ensuring, through periodic review and personal contact, that aggressive OJT programs are continually in progress and are getting desired results.	
7	establishing controls to ensure that OJT is properly recorded and reported.	
8	ensuring that all subordinate commanders, staff officers, supervisors, and trainers are scheduled to attend appropriate OJT Advisory Service Courses.	AFR 50-23, AFR 50-54
*9	ensuring that the evaluations prescribed in table 2-2 of this regulation are accomplished (table 2-5 for ANG and AFRES personnel).	AFR 50-23
10	ensuring that actual and potential squadron OJT managers attend the appropriate OJT advisory service courses.	
11	ensuring the OJT program is conducted free from discrimination with regard to an individual's color, race, religion, or sex.	AFR 30-2
*12	considering personnel who fail to progress (training status code T) or who are not recommended for further upgrade training (training status code 0) or retraining for separation under the provisions of AFR 39-10, paragraph 3-8l or AFM 39-12, paragraph 2-4a or 2-4c.	AFR 50-23, AFR 39-10, AFR 39-9, AFM 39-12
*13	designating, with the assistance of the unit OJT manager, a primary (and alternate, if available) task evaluator for each AFSC authorized by the unit manning document (UMD). (Not applicable for ARF personnel.)	AFR 50-23
*14	evaluating personnel in TSC "O", not recommended for entry into UGT, and TSC "T", withdrawn from UGT for nonprogression at least every 90 days. The purpose of the evaluation is to determine individual's improvement efforts.	
*15	evaluating trainee's potential to progress after a two-time CE failure and document the evaluation on AF Form 623a.	

TABLE 4-3

CBPO/OJT UNIT RESPONSIBILITIES

DUTY	A	B
	The servicing CBPO OJT manager's duties are to	**Applicable Directives**
1	ensure that established directives and procedures are followed to provide a uniform and effective OJT Program.	AFR 50-23
2	prepare standard operating procedures, if necessary, for the base level OJT Program.	AFR 5-1, AFR 50-23
3	familiarize all concerned personnel with the concepts, scope, objectives, methods, and procedures pertinent to OJT.	AFR 50-23 and publications referenced herein.
4	maintain liaison between the CBPO and serviced organizations on all OJT matters.	AFR 50-23
5	help commanders, squadron OJT managers and trainers in developing sound training programs, and provide guidance and assistance in associated administrative matters. (For AFRES units, prepare AF Forms 623 and deliver them to the section supervisor.)	
6	maintain currency of ECI information to ensure that the information on policies, procedures, and CDCs is accurate.	AFM 30-130, vol I, AFR 50-23, AFR 50-12, The ECI Catalog and Guide/microfiche for Extension Course Administration.
7	Advise unit OJT managers of changes in CDC availability.	
*8	administer mandatory CDC CE within 30 days (two monthly training periods for ANG/AFRES) after receipt of the test and volume review results except when unusual circumstances exist. These circumstances may be recorded directly on the test package or by attaching the letter provided by the supervisor. This responsibility is delegated to the GSU OJT manager (see note 1).	
9	provide professional advice and assistance to supervisors, trainers, and trainees on CDC matters.	
10	make sure that OJT trainees are enrolled in and complete all requirements of applicable CDCs.	
11	coordinate with other CBPO personnel on matters relating to classification, assignment, and utilization of personnel being trained through OJT.	AFM 30-130, vol I, AFR 35-1, AFR 50-23
12	act as coordinator in arranging for training facilities, equipment, films, and special instructors.	AFR 50-23, AFM 50-62
13	coordinate training matters with FTDs; prepare requests for FTD assistance in conducting normal upgrade, qualification and retraining; and review FTD production reports.	AFR 50-54, AFM 50-5
14	request, schedule, and monitor OJT Advisory Service Courses to support all units serviced by the CBPO.	AFR 50-23
15	review approved requests for retraining (see note 3).	AFR 39-4, AFR 50-23, AFM 30-130, vol I
16	ensure that personnel are entered into UGT after receiving approved retraining actions (see note 3).	
17	ensure that all eligible airmen have been entered into training.	AFR 50-23
*18	submit a statement of the circumstances through the DP to the parent MAJCOM of the unit involved when UGT capability is not available.	
19	ensure that all ineligible airmen are removed from training.	
20	identify personnel in UGT not later than 30 days prior to end of maximum training period and direct action according to table 2-2 (table 2-5 for ANG and AFRES personnel).	AFR 50-23, AFR 35-1
21	coordinate on all AF Forms 209X that affect upgrading of airman AFSCs or affect an airman's UGT status.	AFM 30-130, vol I, AFR 35-1, AFR 50-23
22	coordinate all requests for AKT testing.	AFR 35-1
23	maintain a current listing of all personnel in UGT.	AFR 50-23, AFM 30-130, vol I
24	maintain, publish, and distribute current UGT statistics.	AFR 50-23

(Table continued on next page.)
(See notes at end of table.)

TABLE 4-3 (CONTINUED)

DUTY	A	B
	The servicing CBPO OJT manager's duties are to	**Applicable Directives**
25	prepare higher headquarters directed UGT reports.	AFR 50-23, AFRESR 50-11
26	serve as a member of or advisor to, all classification boards evaluating airman training actions.	AFR 50-23, AFR 35-1
27	determine validity of local OJT reports by spot checking actual training.	AFR 50-23
28	maintain an operational file of applicable publications that direct, control, or otherwise affect OJT management.	AFR 5-31, AFRESR 50-2
29	monitor completion of the unit 180 day visits and maintain a file of these visit reports. These reports should be reviewed prior to the annual visit to aid in determining trends and possible problem areas. (These visits are required once a year for ARF units.) If the unit reports are not comprehensive and quality training oriented, return them to the unit for reaccomplishment.	AFR 50-23
30	review the appropriate training documents to ensure eligibility and completion of all training requirements prior to coordination on AF Form 2096.	
*31	conduct a staff assistance visit to each on base unit at least once a year (not to exceed 12 months between visits), to evaluate the effectiveness and quality of training. Comments in the report will include as a minimum: support of OJT program; unit OJT management effectiveness, training problems such as status of overtime or nonproductive trainees; CDC course exam failures, etc., whether contingency training requirements are identified and met; assessing effectiveness of actual training methods and techniques used; assessment of training being conducted--quality, quantity, timeliness; and assistance rendered. A visit will be made to GSUs if requested by the commander or directed by the MAJCOM or SOA. When units visited are rated less than satisfactory, a followup visit will be made within 60 days (120 days for ANG and AFRES units). Prepare reports of visits and send one copy of each report to the unit commander and one copy to the parent MAJCOM or SOA. The report should arrive within 15 days after the visit (see notes 2, 4, 5, and 6). (AFRES GSUs will be visited once a year.) (See note 7.)	
32	review during the annual staff visit the training status of each assigned Mobilization Augmentee (MA). Furnish a summary of the findings to the Air Reserve Personnel Center (ARPC/RTTT) and HQ ANG, as applicable.	AFR 50-23, AFR 35-41
33	conduct monthly meetings with on-base unit OJT managers. Minutes of these meetings should include the personnel who attended, those absent, and a resume of items discussed. Provide copies of these minutes to commanders and parent MAJCOM OJT managers. (This meeting is required quarterly for ANG and AFRES.)	AFR 50-23
34	ensure accuracy of computerized training data inputs.	AFR 50-23, AFM 30-130, vol I
35	provide each unit current copies of the monthly UGT roster.	AFR 50-23
36	manage the computer directed training system (CDTS). Perform duties of training system manager (TSM) (see note 3).	AFR 50-23, AFM 50-108
37	randomly select individuals from sections and work centers to have their performance evaluated during the annual staff assistance visits, as required in chapter 5 (optional for ARF).	AFR 50-23
38	monitor the Air Force Equal Opportunity Affirmative Actions Plan, Objective E-102, On-The-Job Training.	
39	interview all prospective 751X2 retrainees and attach comments regarding their potential to be training managers to the request for retraining or reclassification.	
*40	conduct informal assistance visits within units or workcenters experiencing problems or developing unfavorable trends. Maintains memos of assistance rendered.	AFR 50-23
*41	schedule reading achievement test during inprocessing for personnel entering UGT, whose reading grade level is less than 9th grade completion.	
*42	during the annual OJT Staff Assistance Visit review the unit's WAPS material (including workcenter publications) to ensure they are current, properly posted, and are of sufficient quantity to meet the unit's needs.	AFR 35-8, AFR 50-23 and AFP 39-8
*43	monitor the scheduling, training, and records documentation of personnel participating in the WARSKIL program.	AFR 35-56, AFM 30-130, Vol I, and AFR 50-23

(See notes on next page.)

NOTES: 1. Bases may request permission from the MAJCOM OJT manager (for ANG, request permission from the State Adjutant General or a designated representative) to allow selected squadron OJT managers to administer CDC CEs at locations other than the CBPO if personnel shortages and available facilities dictate. Selected personnel must be 7-skill level or higher. When CEs are administered at locations other than the CBPO, they must be returned to the CE test control office within 72 hours.

2. AFRES units send the report of visit to the applicable Numbered Air Force (NAF) instead of the parent MAJCOM. ANG units furnish the report of visit to unit commanders only.

3. Not applicable to ANG and AFRES units.

4. The OJT Program should be made an item of special interest for IG visits to those GSUs that have not had a staff visit or evaluation within 12 months.

*5. Visit schedules should be coordinated with the appropriate staff agency, that is, Deputy Chief of Maintenance (DCM), or equivalent and when possible, should be held in conjunction with 180 day visits performed by Quality Control.

6. On-base units with five or less airmen assigned and none of which are in upgrade training are exempt from this duty.

*7. CBPO-OJT managers are not required to visit ESC units. The OJT effectiveness of these units will be evaluated by HQ ESC.

TABLE 4-4

GROUP, SQUADRON OR DETACHMENT OJT MANAGER'S RESPONSIBILITIES (see note 5)

D U T Y	A The Squadron OJT manager's responsibilities are to	B Applicable Directives
1	indoctrinate the officer in charge, supervisors, and trainers on the concepts, scope, and objectives of OJT.	AFR 50-23
2	provide supervisors with access to all directives pertinent to their OJT program.	AFR 7-2, AFR 5-31
3	obtain for the supervisors the required type and amount of training literature.	AFR 50-23, AFR 7-2
*4	ensure all UGT trainees have been enrolled and received applicable CDCs as specified in the ECI Catalog and Guide/Microfiche for Extension Course Administration.	The ECI Catalog and Guide/Micorfiche for Extension Course Administration, AFR 50-23
5	help the supervisors select trainers.	AFR 50-23
6	help the unit commanders select task evaluators and maintain a current listing of designated evaluators (optional for ARF).	
7	counsel supervisors about trainer-trainee working relationships and methods of training on the job.	
8	counsel supervisors on the necessity for trainee motivation while taking part in CDCs.	
9	conduct visits to individual sections at least every 180 days (for ANG and AFRES units annually) to review the OJT program effectiveness of the unit. With the assistance of task evaluators, conduct performance evaluations using the guidelines established in chapter 5. Send a written report of each visit through the commander to the section visited. Comments in the reports will include as a minimum: training problems such as status of overtime or nonproductive trainees; CDC course exam failures; trainees with reading and typing deficiencies, etc., whether contingency training requirements are identified and met; assessing effectiveness of actual training methods and techniques used; assessments of training being conducted--quality, quantity, timeliness, and guidance and assistance rendered. Also send one copy of the report to the CBPO OJT unit. See note 6.	
10	monitor request for classification actions indicated as a result of unit OJT actions. Ensure the AF Form 623 accompanies each upgrade request submitted to the CBPO.	AFM 30-130, vol I, AFR 50-23
11	perform informal visits to each section between semiannual (annually for AFR units) staff assistance visits and if appropriate, prepare and file memos for the record for review prior to future visits.	AFR 50-23
12	prepare AF Form 623 and deliver to the supervisor.	
13	make sure that incoming clearance procedures are such that change of address and ZIP code shred of test officers are submitted to ECI for incoming personnel enrolled in CDCs.	AFR 50-23, The ECI Catalog and Guide/ Microfiche For Extension Course Administration
14	make sure that reassigned trainees depart organizations with all CDC materials and answer sheets thereto.	
15	receive and deliver ECI materials to the immediate supervisor for personnel enrolled in CDCs. Retain volume review exercise (VRE) answer sheets (optional for ANG and AFRES).	
16	make sure that ECI material received after reassignment of students is forwarded, with a copy of reassignment orders to gaining organizations or office designated to administer CEs.	
*17	schedule upgrade trainees for administration of an appropriate reading test if no record of previous testing exists. Trainees scoring less than a 9th grade completion will be entered into a reading and comprehension development program conducted by the Base Education Services Office (see note 1, 2, and 3).	AFR 50-23
*18	ensure all CRE and LOE items have been accomplished before allowing the trainee to complete the VRE answer sheet. The trainee uses a number 2 pencil to transcribe, from the completed VRE workbook, the answers to the VRE answer sheet. Do not allow the answer sheet to be stapled, taped, or mutilated (optional for ANG and AFRES).	
19	forward VRE and CE results to the trainee's supervisor and ensure review training is provided as required.	
20	forward request for CDC enrollment extensions to ECI. When a trainee is scheduled to depart PCS within 60 days of expiration of CDC enrollment date, losing units request an extension from ECI.	
*21	attend monthly (quarterly for ARF units) OJT meetings conducted by the CBPO OJT unit. Conduct meetings every other month to discuss significant topics with unit supervisors. (Unit meetings are optional when there is no one in UGT.) (See note 4.)	

(Table continued on next page.)
(See notes at end of table.)

TABLE 4-4 (CONTINUED)

D U T Y	A	B
	The Squadron OJT manager's responsibilities are to	Applicable Directives
22	ensure the AF Form 623 is forwarded to in-out processing to accompany the field records group of all reassigned personnel.	AFR 50-23, AFM 30-130, vol I
23	maintain a posted and current copy of either the CBPO or MMICS OJT roster. Units (including those who maintain a MMICS OJT roster) will review the CBPO OJT roster and return one corrected copy to the CBPO OJT section within 10 days. (ANG and AFRES units will return the roster within two training periods.)	AFR 50-23
24	when an individual has demonstrated an inability to progress as a result of lack of ability to comprehend required subject matter, refer the trainee to the Base Education Services Center for administration of an appropriate reading and comprehension test. Enroll airmen with scores below the 9th grade level in a developmental reading program conducted by the Base Education Services Center (see note 3).	
25	review the PDO Bulletin to determine new, revised, supplemental, and obsolete publications applicable to the OJT program. Request required publications through the unit customer account representative (CAR)	AFR 0-8, AFR 7-2, AFR 50-23
26	maintain a file of current STSs for each AFSC authorized on the UMD.	Publications Bulletins
27	order, issue, and control all STSs for squadron and detachment use. Provide supervisors with copies of new and revised STSs and changes for their review. (CRTO may assume these duties for AFRES units.)	AFR 50-23
28	advise and assist section supervisors in the development and use of master JPGs (optional for AFR units).	
29	advise and assist supervisors in preparing the AF Form 1284, Training Quality Report.	AFR 50-38
30	advise and assist the section supervisor in making sure that all required tasks to support day-to-day production and contingency operations are identified.	AFR 50-23
31	encourage supervisors to read the ECI word.	

NOTES: 1. The reading achievement test is a one-time requirement. It is administered within 30 days after initially entering training.

*2. The Air Force Human Resources Laboratory (AFHRL) has been tasked to provide an updated reading achievement test to replace the USAFI Achievement Test III, parts 1 and 2. In the interim, commands may be authorized to use other reading tests on approval from HQ USAF/MPPTS. However, a command will only be authorized to use one test for the entire command.

3. Not applicable to ANG and AFRES.

4. Where OJT managers are consolidated in a single agency, only one individual need attend.

5. The duties also apply to operating locations and flights.

*6. Units with five or less airmen assigned and none of which are in upgrade training are exempt from this duty.

TABLE 4-8

IMMEDIATE SUPERVISOR'S RESPONSIBILITIES

DUTY	A Immediate supervisor's responsibilities for conducting OJT are to	B Applicable Directives
1	select qualified trainers within the section.	AFR 50-23
2	indoctrinate trainers and trainees on objectives of the OJT program.	
3	determine the number of trainees who can be effectively trained by each trainer without impairing the total mission.	
4	use the duty section Master Job Proficiency Guide to develop the individual JPG as the basic document for training, based on airman's duty position.	
5	certify completion of job proficiency training by initialing and dating opposite appropriate JPG task assignments.	
6	assist trainers in using pertinent directives and developing individual task breakdowns.	
7	motivate personnel associated with the OJT program through daily contact.	
8	provide guidance in methods of training and testing, in personal relations, and in good management principles.	AFR 50-23, AFM 50-62
9	determine the requirement for group training to provide background information and theory when CDCs are not available.	AFM 50-62
10	counsel trainees as problems occur. Counseling must cover strengths, areas needing improvement, attitude, and means to improve. Enter results on AF Form 623a. The counselor and trainee sign and date the entry.	AFR 50-23
11	maintain AF Form 623 for assigned airmen.	
12	submit AF Form 1327, Career Development Courses (CDC) Trainee Critique, when CDCs are considered invalid.	AFR 50-38
13	initiate AF Form 2096 to effect entry into, completion of, and withdrawal from OJT.	AFM 30-130, vol II
14	document review training on reports of volume review exercises, and course examinations.	AFR 50-23
15	advise the squadron OJT manager when airmen are qualified to be administered the AKT.	
16	conduct initial evaluation for all newly assigned personnel within 30 days of assignment to individual duty position. Ensure qualification training is provided and recorded in the individual's training record.	
17	recommend trainee for upgrading when requirements are met.	AFR 50-23, AFR 35-1
*18	conduct a review, with the trainee, of the entire CDC course, to include each VRE and CREs and LOEs prior to allowing the trainee to take the CE. Additional training is required on all items missed.	AFR 50-23
19	ensure the trainee completes the CE within 30 days of receipt (within two monthly training periods for ANG and AFRES personnel). If unusual circumstances prevail, forward a statement through the squadron OJT manager to the CE testing official.	
20	initiate AF Form 1284 when recent graduates from formal AFM 50-5, Formal Schools Catalog courses do not meet the proficiency levels specified for the formal course in columns 2A or 4A of the STS.	AFR 50-38

(Table continued on next page.)

(See note at end of table.)

TABLE 4-5 (CONTINUED)

DUTY	A Immediate supervisor's responsibilities for conducting OJT are to	B Applicable Directives
ch1 21	conduct the first evaluation (2-5). Record the results of the evaluation on the AF Form 623a, specifically addressing requirements of para 2-6	AFR 50-23
ch1 22	act as holder of the CDC package and issue the trainee one volume at a time as prescribed in paragraph 7-5 ANG and AFRES supervisors may assign more than one volume.	
23	ensure each assigned trainee meets the minimum typing requirements as prescribed by the AFR 39-1 AFS description. Provide a typing program (paragraph 6-1d and ensure the typing requirement is certified by use of the appropriate standard typing test. Normally the Base Education Services Center administers the AFPT 70. If no Education Services Center is available at the base of assignment, the unit commander will certify typing proficiency. To verify typing training has been provided (AFPT 70), the trainee may take his or her AF Form 623 to the Base Education Service Center, rather than the special certificate mentioned in the test. The unit commander designates an individual in the unit to administer the AFPT 29 in the work center using the teletypewriting machine (see note).	AFR 50-23, AFPT 29, AFPT 70, AFR 35-8
24	monitor career development course (CDC) progression and provide assistance as necessary (paragraphs 7-9 through 7-12).	AFR 50-23

NOTE: When applicable, enter statement in Remarks Section of AF Form 2096: "Airman meets mandatory typing requirements of ______ words per minute as required by AFR 39-1."

TABLE 4-6

OJT TRAINER'S RESPONSIBILITIES

DUTY	A The OJT trainer's responsibilities are to	B Applicable Directives
1	prepare, under the guidance of the immediate supervisor, detailed task breakdowns as necessary for each airman, indicating the important steps involved in the task.	AFM 50-62, AFR 50-23
2	instruct trainees on actual equipment.	
3	teach theory and background information, when required.	
4	motivate and evaluate assigned trainees.	

TABLE 4-7

OJT TRAINEE's RESPONSIBILITIES

DUTY	A	B
	The on-the-job trainees are responsible for	**Applicable Directives**
1	knowing where to locate and read their AFS description, their immediate training requirements and objectives, and their training folder and its contents.	AFR 35-1, AFR 39-1, AFR 50-23
2	accepting and reacting favorably to motivational efforts of OJT trainers and supervisors.	
3	accepting and performing all training requirements and assignments in an efficient manner.	
4	budgeting available time (on- and off-duty) so that they can complete their CDC and local study assignments within the time limit.	
5	maintaining all issued training materials in good condition for future use.	
6	obtaining appropriate CDC materials and answer sheets from squadron OJT manager when reassigned and delivering such materials intact to the OJT manager at new organization.	AFR 50-23, The ECI Catalog and Guide/Microfiche for Extension Course Admin.

TABLE 4-8

CE TESTING OFFICE RESPONSIBILITIES

DUTY	A	B
	CE testing office is responsible for	**Applicable Directives**
1	receiving, controlling, and administering CEs.	AFR 50-23, The ECI Catalog and Guide/Microfiche for Extension Course Administration
2	forwarding CEs with a copy of reassignment orders to the gaining test officials when CEs are received after reassignment of trainees (see note).	

NOTE: When CEs are forwarded within the 10th month of enrollment or later, the losing unit requests an extension.

Chapter 5

QUALITY OF TRAINING

5-1. Program Development. (This chapter is optional for AFRES and ANG units.) The Air Force OJT Program encompasses both upgrade and qualification training. In the past, efforts have been directed toward records documentation and regulatory compliance. These areas are important and will continue to be monitored; however, the emphasis must be to effectively meet the two-fold objective of OJT. First, to ensure that Air Force enlisted members initially receive the knowledge and job proficiency training to meet AFR 39-1 mandatory requirements for their AFS and perform their assigned job; and second, to conduct qualification training to ensure continued job qualification. Quality training starts with detailed planning, as described in paragraph 5-3. This step is critical in that it is the blueprint for an effective quality training program. The next step is assessment and evaluation of the training program by the section or work center supervisor. As a minimum, use the checklists (attachments 2 and 3) in this regulation and the functional responsibilities listed in chapter 4. The supervisor is then prepared to accept independent evaluations by the unit training manager, unit commander, CBPO-OJT manager, the IG, and other staff assistance or evaluation teams.

5-2. Purpose and Scope. The purpose of the quality training program is to ensure that each unit achieves and maintains a high standard of training excellence and supports the Air Force mission requirements. Quality training ensures that as a minimum, all assigned personnel can consistently perform all parts of their assigned duties correctly while meeting local demands for speed and accuracy and that they can explain when the tasks must be performed and why each step is necessary. In assessing quality training, MAJCOM functional managers, commanders, and supervisors must ensure that all tasks, relative to their unit's mission, are properly identified and that each individual is given a well-planned and quality-oriented training program.

5-3. Planned Training Program. To be effective, an OJT program requires comprehensive planning, careful scheduling, timely implementation, capable direction, skillful application, and searching evaluation. To effectively administer a quality training program, supervisors, trainers, and trainees must have a planned course of action with positive guidelines established. The objective is to plan, schedule, and monitor all training requirements in an organized way. The tools a supervisor uses in developing a planned training program within a section or work center include:

* a. A listing or identification of all recurring training requirements, a master JPG, a guide for briefing newly assigned personnel and conducting initial evaluation, and an aid (AF Form 1320, Training Chart) for consolidating all training requirements. NOTE: The requirement to maintain a training aid for consolidating training requirements is optional, unless directed by MAJCOM.

b. Other documents designed to ensure a clearly explainable and planned training program exists and that the program can be understood and arranged in a logical and usable manner.

5-4. Master Job Proficiency Guide (JPG). Training requirements within every duty section must be clearly defined and understood by all. To develop the standardization necessary in the initial planning stages of a training program, whether it be upgrade or qualification training, use a master JPG to identify all section or work center tasks and AFS related training requirements, including contingency tasks.

a. Section or work center supervisors develop and maintain master JPGs. Immediate supervisors use the master JPG to develop individual JPGs as outlined in chapter 6.

* b. The master JPG consists of an annotated Air Force STS, command JPG (if applicable), and locally developed AF Form 797, Job Proficiency Guide Continuation Sheet. Implementation of the master JPG concept is geared toward helping supervisors identify and provide necessary training. Supervisors must not see this JPG as another administrative burden, but view the JPG as a useful tool in conducting effective training. After initial development, review and update would be necessary only if training requirements change. Examples of this kind of change would be if a new Air Force STS is published, or command or local requirements change due to mission, equipment, or procedural changes. Section or work center supervisors and unit OJT managers must make sure that master JPGs are kept current. Personnel conducting visits and inspections should check for availability and use of the master JPG and assist in further development, when necessary.

***5-5. Master JPG Development.** Guidance for development of a master JPG is as follows:

a. Identify all tasks, regardless of skill level, that are performed in the section or work center plus the AFSC mandatory items identified in AFR 39-1, by circling the proficiency code in columns 2A, 3A, or 4A of the STS.

b. Follow procedures outlined in paragraph 6-7 when AF Form 797 is used as part of the master JPG.

c. If applicable, circle any action verb or noun in the task statement to indicate training is only required to be accomplished on the circled area.

d. If neither an Air Force STS nor a command JPG has been published, develop a local JPG, using AF Form 797.

5-6. Storage of the Master JPG. The section or work center supervisor files and maintains the master JPG in the most convenient manner possible. Recommend use of a kraft folder identifying the particular section and labeled "Master JPG".

5-7. JPG Exemption. Master JPGs are optional unless directed by the MAJCOM OJT or other functional manager, when less than five individuals possessing the same AFSC below the grade of E-7 are authorized in the section or work center.

***5-8. Assessing Quality of Job Proficiency and Qualification Training.** Evaluations will be performed by OJT managers with the assistance of the AFSC task evaluator, during the unit's semiannual and CBPO annual staff visits. Seven percent of the airmen in upgrade training (UGT), and three percent of all other eligible airmen, will be evaluated. The base figure for computing the 3 percent to be evaluated is determined by subtracting the number in upgrade training from the unit's assigned enlisted (grades E-1 through E-6) strength. Select a representative sampling of AFSCs and tasks for evaluation, that is, do not conduct all the evaluations in one AFSC or section.

a. Tasks to be checked will be randomly selected from those identified in the individual JPG which indicates training has been completed. Conduct sufficient checks to determine adequacy and effectiveness of training and to evaluate those tasks that are critical to the success of the job. For individuals found unqualified to perform a completed task, the supervisor refers to procedures outlined in paragraph 6-8.

b. Use AF Form 689, Task Performance Checklist; AF Form 2419, Routing and Review of Quality Control Reports; or similar forms to record personnel evaluations. Multiple task checks conducted per individual may be reported on the same form. Copies of the completed evaluation form should be attached to the visit report.

5-9. Units Supported by an Air Force or MAJCOM Standardized Quality Control or Standardization Evaluation Function (as defined in directives such as AFM 66-1, Maintenance Management; AFR 60-1, Flight Management; SACR 60-4, Standardization/Evaluation Program; and other directives specially authorized by HQ USAF/MPPT). Before beginning the semiannual or annual staff visits, OJT managers review file copies of AF Form 2419 and AF Form 689, or any other approved evaluation form, to determine training problems, trends, and comprehensiveness of local evaluations. Personnel and task performance evaluations required by this regulation are waived for personnel assigned to those work centers and sections evaluated by the quality control or standardization evaluation teams identified above. Personnel evaluated must represent a cross section of all AFSCs within the unit or division. When quality control and standardization evaluation functions are limited to specific AFSCs or areas, OJT staff visit personnel must ensure performance capability is measured for all other AFSCs not evaluated.

JOB PROFICIENCY AND QUALIFICATION TRAINING

***6-1. Using the STS as the Basic Training Document.** Each airman's AF Form 623 must contain a job proficiency guide (JPG). When an annotated STS is inserted in the AF Form 623, it becomes an official part of that training record and is called a JPG. Procedures for annotating an STS when it is being used as a JPG, and for maintaining the JPG, are provided below.

*a. Page 2, STS. On the inside cover of each STS is a block used to identify both the trainee and the immediate supervisor. In the trainee's name section, print the trainee's name. In the initials section, have the trainee write his or her initials. Then enter grade and organization. In the Immediate Supervisor's Names and Initials section, the supervisor prints his or her name and writes his of her initials. The extra spaces are for a change in the trainee's supervisor. If additional space is needed, use AF Form 623a.

*b. Using STS as JPG. When an STS for an AFS exists, use it as a JPG, as specified here (see figure 6-1). Supplement the annotated STSs only to add tasks, never to duplicate tasks already in the STS. For example, the STS may contain as many as 150 or more separate tasks, but if the airman currently performs only 20 of these tasks plus 5 locally assigned tasks, fill in the JPG only to the extent of the 25 applicable items. Accomplish this as specified in this chapter. The actual job requirements and the present skill level of the trainee determine the appropriate task element and the proficiency level. These must be circled to indicate the level of skill to which trainee is training for that particular task element. The "locally assigned tasks" are duties the airman performs that are not already identified on the STS. Add these to the annotated items on the STS by use of a JPG Continuation Sheet (AF Form 797 shown in figure 6-2). The annotated items on the STS, plus any additional items attached to the STS, constitute an acceptable JPG, as long as it meets the essential element requirements listed below:

(1) A list of tasks for the position to which the airman is currently assigned.

(2) Required proficiency levels (work standards) for all tasks.

(3) Training references to Air Force and other publications (technical orders, Air Force manuals and regulations, command publications and directives, and local office instructions) for each task assigned to the trainee.

(4) Space for both the supervisor's certification and the trainee's acknowledgment when the prescribed proficiency level has been attained for each assigned task. After upgrading, use the JPG to record the qualification training described in paragraph 1-2b.

c. Converting STS to JPG. When an STS is used to record training, as outlined in this regulation, it becomes a JPG. Pen-and-ink changes to convert the STS to a JPG are not required. To convert an STS to a JPG, the trainee's immediate supervisor must:

(1) Designate the tasks assigned to the individual airman in his or her specific job by annotating the STS.

(2) Provide specific job- or equipment-oriented technical references, as required, for all assigned tasks.

*(3) Determine required proficiency levels for locally assigned tasks and for those tasks where the local proficiency level requirements differ from the level shown on the STS. NOTE: Proficiency levels may be upgraded but not downgraded. Regardless of the proficiency level indicated on the STS, the minimum level for all 5- and 7-skill airman will be 3c (this includes 5- and 7-skill level trainees). There is no need to change the code indicated in column 3A to reflect this change in STS and JPG proficiency requirements. (This is an interim step in the development of the "GO/NO GO" theory.)

(4) Certify the trainee's achievement of the prescribed proficiency level.

d. Certifying Job Proficiency:

(1) Immediate supervisors must certify job proficiency on the JPG as a prerequisite for airman upgrade actions. Certification authority can be delegated to the trainer, when training is conducted in functions outside the area of expertise or control of the immediate supervisor.

(2) To ensure that the trainee acquires typing proficiency when required by the AFR 39-1 specialty description, the immediate supervisor establishes a systematic training program with monthly goals based on the trainee's initial typing ability. All trainees, whose typing ability is not known, must be given the appropriate standard typing test wthin the first 60 days after entry into training in order to establish the initial proficiency level. Immediate supervisors establish a training program with monthly goals based on the trainee's initial test score. Trainees must meet the minimum proficiency before being recommended for upgrading. Supervisors must regularly monitor each trainee's progress. The training program consists of:

(a) Attendance at the base typing school, if available and appropriate.

(b) Supervised on-the-job practice sessions designed to ensure satisfactory progress.

(c) Maintenance of typing progress on the AF Form 623a which is certified monthly by the supervisor.

NOTE: Trainees with no previous typing training or experience need not be initially tested, but will be promptly entered into appropriate training programs. Technical school graduates completing typing requirements equal to or exceeding the requirements for the next higher skill level need not be tested, if the immediate supervisor's assessment of proficiency on the job supports the training certification.

***6-2. Making JPG Assignments.** When proficiency and or study (knowledge) items in column 1 of the STS are identified as requirements by the immediate supervisor, circle in pencil the proficiency level in column 2A, 3A, or 4A, applicable to the level to which training is being assigned. As training is started on the task, enter the date in pencil in column 2B, 3B, or 4B, applicable to the level to which training is being conducted. When training is completed, enter the date training was completed and the initials of the trainee and supervisor. When training to more than one skill level is documented on the same JPG, the circles in previous columns need not be erased. Where the STS task outlines more than one noun or action verb (for example, remove, replace, starters, actuators, etc.), the supervisor must certify completion of the appropriate nouns or action verbs in columns C of the STS. When qualification cannot be completed on the entire task, the supervisor circles the noun or verb to be trained and initials by the circle to indicate a change in requirements. The task is signed off in the normal manner when training is completed on the circled noun or verb. When no nouns or action verbs are circled, certification indicates qualification on the entire task. Figure 6-1, item 5d, is an example to show that an airman is trained and certified to "type drafts of regulations."

6-3. Recording Qualification Training on JPG. Even after a trainee is upgraded, recording of applicable qualification training on the JPG continues.

a. Qualification training is recorded on the JPG by making entries identical to those required for formal UGT.

b. Each time an airman changes duty positions, the immediate supervisor performs an evaluation that includes a review of all previous JPG or automated training product entries and determines the extent of training required for the new position. The supervisor then identifies all tasks applicable to the new position. If the airman was previously qualified on the task, the supervisor determines if he or she is still qualified. If the airman is found to be unqualified on a previously certified task applicable to the new position, the supervisor establishes a qualification training program for that task.

c. Special Duty Identifier (SDI) qualification training (not applicable to ANG and AFRES forces) is accomplished in the same manner used for training personnel for whom no CDC exists. Since no STS is available for SDI positions, the immediate supervisor provides the necessary special training materials and records all training on a locally prepared JPG for the SDI position (see paragraph 1-3b).

*6-4. **Disposition of the JPG.** Only JPGs for the individual's current skill levels (includes both UGT and qualification training) are required to be maintained in the AF Form 623. When an individual holds a CONUS/overseas imbalanced specialty, retain the JPGs for both awarded specialties in the AF Form 623. If an airman enters retraining, in addition to the current JPG being used for the retraining, maintain the JPGs for the training out AFSC until the individual reaches a skill level equal to the training out AFSC. JPGs for previous skill levels are given to the individual, unless training for the current skill level is on the same JPG.

6-5. New and Revised STSs. When an individual is initially entered into training, use the most current edition of the applicable STS to develop the JPG. However, it is not necessary to file a new STS in an individual's AF Form 623 each time a new or revised STS is published. When a new or revised STS is published, the supervisor must review the new STS to compare it with the JPG being used for training in order to determine if all required training can be identified and accomplished on the existing JPG. The supervisor who reviews the new STS annotates it with the date reviewed, signs it, and files the annotated copy with the master JPG.

a. The immediate supervisor has three options for recording proficiency or qualification training in the new or revised STS or JPG:

(1) Determine whether to use a new STS or JPG to identify and certify current position training and retain all previous JPGs (for the current skill level) in the AF Form 623, as required by paragraph 6-4.

(2) Use existing JPGs to identify and certify current duty position training requirements.

(3) Use a single JPG to identify and record both past and present task qualifications.

*NOTE: If supervisors elect to use option 3, consolidating entries on one JPG), the most current STS will be used to reflect both current and past qualifications. When transcribing past qualifications not required in the new duty position, only previously certified dates are carried forward. For previsusly completed tasks which are required in the current position, supervisors must recertify qualifications using current dates and inititals. Under no circumstances should supervisors transcribe someone else's initials. When this option is used give the old JPGs to the individual.

*b. When a 5-skill level AFSC is created as a result of AFR 39-1 conversion, the old 3-7 skill level STS may be expanded to record 5-skill job proficiency training pending the activation of a revised STS. The supervisor enters the required proficiency code 3c in column 3A of the STS for those tasks required in current position. When a conversion action only changes the AFSC number and does not change the content of the STS the old number may be lined out and replaced with the new AFSC number.

c. Any and all published changes to the STS being used as the JPG must be posted.

*6-6. **Processing JPG After Airman Is Transferred.** When a trainee is transferred to another duty section, the new immediate supervisor, along with the trainee, reviews all pencil entries (training assignments) on the JPG. If a training capability for that task exists in the new section, the training on that item is continued until it is completed. If a training capability does not exist or if training is not required, erase the circle from the proficiency level column and date started training. Any time a previously certified task is not required in the present position, erase the circle in column 2A, 3A, or 4A (or in AF Form 797 proficiency level column), for the appropriate skill level used to specify that the task was required. This is done so that the JPG continues to reflect the tasks that apply to the airman's present position and skill level. It does not in any way affect certification of the task. However, individuals will not be task evaluated on tasks not required for the current duty position.

6-7. Sample JPG. Figure 6-1 shows sample JPG page with typical entries. When additional items not listed in the JPG are required in the current duty assignment, enter these additional items on the AF Form 797. Figure 6-2 is a sample AF Form 797 with correct sample entries. Annotate the form, when required, according to the following information.

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a. "Paragraph Number" Column. Starting with the number "1", each task is numbered sequentially.

b. "Tasks, Knowledges, and Study References" Column. This column is used to add locally required tasks and knowledge as determined by the immediate supervisor. Also, in the same block with each task, the supervisor lists the applicable study references (SRs).

c. "Skill Level" Column. This column identifies the skill level to which the airman is training or trained.

d. "Proficiency Level" Column. Supervisors determine the knowledge and proficiency levels for each task based on requirements. However, 5-7 skill levels require 3c levels as a minimum. Enter the levels directly adjacent to the appropriate skill level. Circle proficiency levels to indicate training requirements and tasks performed.

e. "Date OJT Started," "Date OJT Completed," "Trainee Initials," and "Trainer Initials" Columns. Annotate these columns in exactly the same manner as that of the basic STS or JPG.

f. "Date" Block. Enter in this block the same date the AF Form 797 was initiated.

g. "JPG/STS Number" Block. Show the STS or JPG AFSC number in this block. Enter the trainee's last name and SSAN on the first page only.

h. "Page Number" Block. In this block, the supervisor indicates the page number sequence, starting with page number "1".

i. Manner of Making Entries on AF Form 797. The entries on this form may be made in ink, pencil, or typed, except for the circle placed around the proficiency level and date training started, which are pencil entries.

j. Numbering MAJCOM Developed JPGs or Continuation Sheets. Number MAJCOM developed JPGs or Continuation Sheets according to the directions of the MAJCOM.

6-8. Decertification and Recertification. When an airman is found to be unqualified on a JPG task previously certified for his or her assigned position, the supervisor lines through the previous certification. Appropriate remarks are entered in AF Form 623a, as to the reason for the decertification. The individual is recertified (if required) either by use of correction tape over the previously certified entry (if the entries were made using ink) or by a new entry on the AF Form 797 according to this chapter.

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6-9. AF Form 1098, Special Task Certification, and Recurring Training. The AF Form 1098 (figure 6-3) may be used to document selected special task qualifications of a critical nature, selected tasks requiring recurring training or evaluation, and selected tasks where the supervisor relies on someone else to validate the individual's qualifications. When used for these purposes, it becomes a part of the AF Form 623. Additionally, Air Force and major command directives may identify tasks contained in the STS that require special certification or recurring training or evaluation. Qualifications for these selected tasks may be documented on the AF Form 1098 in lieu of the STS. This form consolidates the status of qualifications of a critical or recurring nature where they may be readily reviewed by the supervisor without screening all routine entries in the JPG and AF Form 623a. The form may be disposed of when all of the entries are noncurrent. The form may be overprinted at command, wing, or unit level to standardize common entries and reduce administrative workload. Those items of a permanent nature may be entered on a separate form. When initiating the form for recurring entries, consideration should be given to grouping entries with the same recurring date, such as monthly, quarterly, semiannually, and annually. An appropriate number of spaces should be left between entries in column A to preclude the need for reentering the information at frequent intervals. A heavy black line should be drawn across the form to enclose the required number of entry lines. As reevaluations are completed, the appropriate entries are made in columns B through H. Line out noncurrent entries.

a. The following is an explanation of the entries to be made on the AF Form 1098. Leave nonapplicable columns blank.

(1) Column A--Enter the selected special task and the applicable directive which requires qualification or training.

(2) Column B--Enter the type of evaluation, such as P for practical or W for written. When both a practical and written evaluation are required, a diagonal line will be drawn in the applicable columns B through E to separate the required information. When the entry pertains to training, enter C for classroom, P for practical, or SS for self-study.

(3) Column C--Enter the date the evaluation or special training was completed.

(4) Column D--Enter the score, rating, or when required by the applicable directive, the number of hours of training received.

(5) Column E--Enter the date refresher training or reevaluation is required.

(6) Column F--Enter the name or signature of the evaluator or instructor, when other than the supervisor or certifying official, and when this information is required by the applicable directive. An entry in this column does not constitute certification of an individual's task qualification, unless accompanied by an entry in column H.

(7) Column G--Have the trainee initial to indicate he or she is aware of, and agrees with, applicable entries.

(8) Column H--The supervisor or the certifying official signs here. Print the name of the certifying official here when you transcribe the entry from some other source document, unless otherwise specified in the

applicable directive. An entry in this column indicates the individual is qualified to perform the applicable task without direct supervision. When the evaluation is accomplished by someone other than the supervisor or certifying official, the supervisor will sign this column indicating the individual is qualified. Name, SSAN, and grade are self-explanatory. Enter the current control AFSC of the individual in the space for AFSC.

b. All applicable entries may be made in pencil, ink, typed, or any combination of the three.

c. The supervisor reviews the AF Form 1098 during the initial evaluation. The supervisor places his or her initials in column H for those entries that are current and which the supervisor determines the individual is qualified to accomplish in the new duty assignment. Reevaluation is not required for the entries that the supervisor initials until the due date indicated in column E of the form. Those entries that the supervisor determines are not current or that require refresher training or reevaluation, are lined out and reentered when the required action is completed.

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1. TASKS, KNOWLEDGE AND STUDY REFERENCES	PROFICIENCY LEVEL, PROGRESS RECORD AND CERTIFICATION								
	2. 3 SKILL LEVEL			3. 5 SKILL LEVEL			4. 7 SKILL LEVEL		
	A AFSC /Crs	B Date OJT Started	C Date Compld & Trainee's Supervisor's Initials	A AFSC	B Date OJT Started	C Date Compld & Trainee's Supervisor's Initials	A AFSC /Crs	B Date OJT Started	C Date Compld & Trainee's Supervisor's Initials
4e. Operate equipment									
SR: Manufacturer's operator instructions on the equipment in use									
(1) Typewriter, electric	***			***			***		
SR: Typing booklets selected by course or supervisor									
***Ability to type 25 words per minute required for 3 skill level; 35 words per minute for 5 and 7 skill levels.									
****(2) Office copy machine	1b/-			2b			3c		
****(3) Keypunch	1b/-			2b			3c		
****(4) Microfiche reader/printer	1b/-			2b			3c	1Aug 80	CSP WJW 15 Aug 80
****Only personnel assigned to operate equipment.									
5. PUBLICATIONS FORMS MANAGEMENT									
SR: AFM 9-1; AFRs 0-1, 0-2, 0-4, 0-9, 5-1, 5-2, 5-4, 5-31, 6-1, 7-2, 9-2, 12-30									
a. Objectives of publications and forms management	A		—	B			C	1Aug 80	CSP WJW 2 OCT 80
b. Develop, edit, review (WJW) and coordinate operating instructions	-			2b	1Mar 79	CSP WJW 16 Mar 79	3c	NO ADVANCED COURSE	
c. Type operating instructions in final format	2b			2c			3c		
d. Type drafts of regulations (WJW), supplements, and changes	2b			2c	2Apr 79	CSP WJW 1 May 79	3c		
e. Edit, coordinate, and review regulations, supplements, changes, and revisions	-			2b			3c	1Sep 80	
f. Establish publications requirements with PDO and distribute publications to users	2b			2c			3c		
g. Maintain functional publications libraries and individual publications sets	2b			2c			3c		
h. Use the publishing bulletin	2b			2c	2Apr 79	CSP WJW 4 Apr 79	3c		
i. Requisition forms and publications from the PDO and distribute to users	2b			2c			3c		
j. Request reproduction and duplication services	2b			2c			3c	1Oct 80	
6. ADMINISTRATIVE COMMUNICATIONS MANAGEMENT									
a. Process official incoming/outgoing communications									
SR: AFRs 10-1, 182-2, 205-1; DOD ISPR 5200.1-R									
(1) Accountable	2b			3c	5May 79	CSP WJW 17 May 79	4d		
(2) Regular	2b			2c	15May 79	CSP WJW 28 May 79	3c		
(3) Suspense systems	1b			2c			4d		
b. Type drafts and final formats of administrative communications									
SR: AFMs 10-4, 11-2, 100-20; AFP 13-2; AFRs 10-1, 10-6, 10-7, 12-17, 205-1; DOD ISPR 5200.1-R									

Figure 6-1. Job Proficiency Guide, Sample Page.

JOB PROFICIENCY GUIDE CONTINUATION SHEET

PARAGRAPH NO.	TASKS, KNOWLEDGES AND STUDY REFERENCES	SKILL LEVEL	PROFICIENCY LEVEL	DATE OJT STARTED	DATE OJT COMPLETED	TRAINEE INITIALS	TRAINER INITIALS
1	Process Tentative Speciality Training Standards (STS) TR: 8-13	3	2b	1 Nov79	3Dec79	CAP	WJW
		5	3c	1 Jan80			
		7					
2	Student Administration TR: ATCM 50-21, FTR 50-5, AFM 50-5	3					
		5					
		7					
a	Conduct formal student counseling TR: FTR 50-5	3	2b	14Nov79	1Dec79	CAP	WJW
		5	3c	8Jan80	1Feb80	CAP	WJW
		7					
b	Prepare and Maintain ATC Form 379 TR: ATCM 50-21	3	2b	1 Jan80	27Jan80	CAP	WJW
		5	3c				
		7					
c	Prepare AF Form 1256, Certificate of Training TR: AFM 50-5	3					
		5	3c	1Jan80	20Jan80	CAP	WJW
		7					
3	Monitor Classification Action Requests TR: AFR 35-1, AFM 30-130 Vol II	3					
		5	3c	6Jan80			
		7					
		3					
		5					
		7					
		3					
		5					
		7					
		3					
		5					
		7					
		3					
		5					
		7					
		3					
		5					
		7					

DATE	TRAINEE NAME AND SSAN	PAGE NUMBER
1 Nov 79	STS 702X0B, Perez 678-90-1324	1

AF FORM 797 PREVIOUS EDITION WILL BE USED.

Figure 6-2. AF Form 797, Job Proficiency Guide Continuation Sheet (Sample).

SPECIAL TASK CERTIFICATION AND RECURRING TRAINING

TASK OR RECURRING TRAINING AND STUDY REFERENCES A	EVALUATION OR TRAINING				EVALUATOR OR INSTRUCTOR F	TRAINEE INITIAL G	SUPERVISOR OR CERTIFYING OFFICIAL H
	TYPE B	DATE COMPLETED C	SCORE OR HOURS D	DUE DATE E			
MD-3 Power Unit T.O. 35C2-8-304-1	P	13 Jan 79	SAT			WJW	Charles Nagel
LOX Servicing ~~T.O. 1C-59-2-2~~	~~P~~	~~8 Aug 79~~	~~SAT~~			WJW	~~Charles Nagel~~
Quick Service Supervision T.O. 00-25-172	W/P	15 Aug 79	90/SAT			WJW	Charles Nagel
LOX Servicing T.O. 1C-59-2-2	P	8 Oct 79	SAT			WJW	Charles Nagel
NOTE: THE EXAMPLES SHOWN ABOVE ARE FOR PERMANENT TYPE ENTRIES.							
ENGINE RUN, T-38	~~W/P~~	~~14 Jan 79~~	~~94/SAT~~	~~14 Jul 79~~		~~WJW~~	MTS ~~Charles Nagel~~
AFR 60-11	W/P	14 Jul 79	94/SAT	14 Jan 80		WJW	MTS Rick Jones
T.O. 1T-38C-2-4							
MARSHALLING SIGNALS	P	14 Jan 79	SAT	14 Jan 80		WJW	Will Edwin
AFR 60-11							
Welder Certification	P	3 Jan 79	SAT	3 Jan 80	Gene Thatch	WJW	LPA Jim Young
Group 1							
AFR 66-25							
NOTE: THE EXAMPLES SHOWN ABOVE ARE FOR RECURRING TYPE ENTRIES.							

NAME OF TRAINEE (*Last, First, Middle Initial*)	SSAN	GRADE	AFSC
WILLIAMS, WILLIAM J.	661 74 5203	TSgt	43172

Figure 6-3. AF Form 1098, Special Task Certification and Recurring Training (Sample).

Chapter 7

CAREER KNOWLEDGE REQUIREMENTS

SECTION A-PREPARATION AND DEVELOPMENT OF CAREER DEVELOPMENT COURSES (CDCs)

7-1. General Description of CDCs:

a. Determining CDC Requirements. Fundamental knowledge required for upgrade training is presented in CDCs. When an airman receives career knowledge training through enrollment in the CDC, voluntary or otherwise, or through study of the STS SRs, he or she satisfies the Dual Channel OJT Program career knowledge requirement. The basic general consideration in determining a CDC requirement is a minimum total worldwide personnel authorization of 100 for the specific skill level of the AFSC. This authorization is determined by considering both active duty and Air Reserve Forces (Air National Guard and Air Force Reserve). When an AFSC meets the numerical requirement, then the following additional factors are considered:

(1) Criticality and training priority of the AFSC.

(2) Population trends and personnel distribution.

b. Career Development Course and Specialty Knowledge Test Compatibility. CDCs, when available, are used as primary reference for SKTs. Since both CDCs and SKTs are based on the same specialty training standards (STSs), CDC coverage of material for both upgrade training and SKT support is closely related. CDC content is primarily upgrade training oriented. However, when necessary, CDCs include additional related material for SKT support.

7-2. Planning and Preparing CDCs:

a. USAF Program Technical Training and CDCs. ATC lists all CDCs being developed in volume II, section IV, of the USAF Program Technical Training (PTT) which is distributed to the MAJCOMs. The PTT also contains listings of CDCs currently being prepared, revised, or already activated. ECI also announces the activation of CDCs through The ECI Word and The ECI Catalog and Guide for Extension Course Administration (supplemented by mailing lists to education and training personnel in the field). Each airman entered into upgrade training must successfully complete all CDC requirements applicable to his or her particular AFS, as listed in The ECI Catalog and Guide. CDCs that require completion of a prerequisite CDC are included in the ECI Catalog. (Prerequisite CDC requirements must be canceled when the provisions of paragraph 7-4a are complete.) To determine requirements for enrollment (mandatory and voluntary) in CDCs, refer to The ECI Catalog and Guide for Extension Course Administration.

b. ATC Responsibilities. To satisfy the requirements that apply to planning and preparing CDCs, ATC:

(1) Determines requirements for CDCs, based primarily on total Air Force worldwide authorizations and on the availability of other training programs and materials suited to the OJT program.

(2) Programs and schedules CDC production, evaluation, and revision, as needs dictate.

(3) Prepares CDCs as single-skill level courses designed primarily to satisfy the upgrade knowledge for the specific AFSC levels contained in the STS and to support the CDC and SKT primary reference concept.

(4) Submits CDC manuscripts (except those for AFSCs 202X0, 207X1, 207X2, and 208X0) to the Extension Course Institute (ECI) and provides for its support according to AFR 50-12, Extension Course Program.

(5) Answers student questions on ECI Form 17, Student Request for Assistance.

(6) Programs yearly and special reviews and evaluations to ascertain the need for revisions of CDCs.

c. Air Force Systems Command (AFSC/DPEA):

(1) Determines the requirements for job education training (JET) packages in support of the career development program related to reporting identifiers 99104, 99105, and 99106.

(2) Schedules production and revisions of required JET packages.

(3) Reviews, approves, and distributes JET packages prepared and published by ATC.

(4) Evaluates the JET program to indicate required revisions to the JET packages.

d. Extension Course Institute (ECI). Publishes and administers all CDCs (except those for AFSCs 202X0, 207X1, 207X2 and 208X0) according to instructions contained in AFR 50-12. The ECI also establishes and publishes standard procedures for administration of all USAF extension courses and CDCs, including the following:

(1) Teaching aids and evaluation instruments - volume review exercises (VREs); Study Reference Guides (SRGs), where applicable; and Course Examination (CEs) - which, together with the textbooks, comprise the complete career development course.

(2) Information regarding activation of CDCs, enrollment criteria, special instructions, and reports of student progress.

(3) Course examination, which is required for successful course completion and award of course completion certificate.

e. The 3480 Technical Training Group is the designated OPR for monitoring the preparation, review, publication, and control of training materials for AFSCs 202X0, 207X1, 207X2, and 208X0. HQ ATC/TTQG also monitors training actions involving these specialties.

f. On recommendation by the ATC preparing agency to deactivate or cancel a CDC or extension course, ECI notifies the field in four consecutive issues of The ECI Word, of both the intention to deactivate the course and rationale for cancellation. MAJCOM and other users address any reclama actions directly to the ATC preparing agency, with an information copy to HQ ATC/TTSS, Randolph AFB TX 78148.

SECTION B-NATURE AND APPLICATION OF CDCs

7-3. Characteristics of CDCs:

a. Requirement for Use of CDCs. All Air Force organizations must use available CDCs as a basis for mandatory career knowledge training. Use of the CDC is mandatory, if a CDC is available. If a CDC is not available, use the STS study references (SRs) and technical references (TRs) to satisfy the knowledge requirement for award of the appropriate skill level AFSC. When neither a CDC nor STS is available, command and local JPGs outline specific knowledge requirements.

b. Content of CDCs. CDCs contain information on career field fundamentals, basic principles, and the common knowledge requirements in each specialty. Equipment-related information may be included when it is necessary to illustrate a principle or its general application. Subject matter included in all CDCs is based on the knowledge elements listed in the approved STS. The letter code level shown in the STS determines the extent of knowledge training for the 3-, 5-, and 7-skill levels. The CDC provides airmen with the knowledge necessary for upgrading to an AFSC skill level and, when necessary, it includes selected review or additional material for SKT support.

7-4. Use of CDCs. Correct use of CDCs involves:

a. Knowing and selecting the correct type of CDC for use.

b. Correctly enrolling in the appropriate CDC.

c. Using the correct CDC study sequence.

d. Using the correct method of studying CDCs.

e. Using the correct course of instruction for management training. (For UGT purposes, ECI Course 9 is used in the same manner as CDCs to effect management training, see paragraph 7-7d.)

7-5. Types of CDCs. The skill levels (3, 5, 7) that apply to the AFS and the previous training determine the knowledge coverage contained in CDCs. As CDCs are revised, prerequisite and combined CDCs are being eliminated. CDCs are prepared for the 3-, 5-, and 7-levels in training priority category B and C skills, and at the 5- and 7-levels in training priority category A skills. However, CDCs are prepared for 7-level AFSs only when there is a significant difference between the technical knowledge requirements of the 5-level and 7-level (or the 3-level and the 7-level when no 5-level exists in the AFS). The following explanation relates to CDC knowledge coverage for each training priority category.

a. Training Priority Category A - Highly Technical Skills. CDCs are not prepared at the semiskilled 3-skill level. Airmen are awarded the 3-skill level by successfully completing a basic resident formal course. A CDC for the 5-skill level is designed primarily to provide the upgrade knowledge training required by the STS elements that indicate a knowledge progression for the 3-skill level to the 5-skill level. The CDC may also contain a limited review of critical knowledge at the 3-skill level when such a review is necessary. In a similar manner, 7-skill level CDCs provide upgrade knowledge training required by STS level. General supervisory training is provided by completion of a management course listed in paragraph 7-7d.

b. Training Priority Category B - Technical Skills. In this training priority category some airmen receive their 3-skill level on completion of a formal basic resident course. The remainder acquire their 3-skill level through OJT. CDCs prepared for upgrading to the 3-skill level in this training category parallel the resident course as far as practical. However, the CDC instructional sequence does not necessarily have to parallel the resident course instructional sequence, since each curriculum is designed for a different learning environment. CDCs for the 5- and 7-levels are prepared in the same manner as described in the preceding paragraph.

c. Training Priority Category C - Semitechnical Skills. Most airmen in training priority category C skills receive their initial 3-level training through OJT. CDCs for AFSCs in training priority category C are designed to fulfill their respective STS element knowledge requirements. Since no basic formal resident courses are available to support CDC preparation, the subject matter coverage is the result of intensive writer research to ensure that the scope and depth of coverage is appropriate to the skill level, and that the information is relevant and current. CDC development to the 5- and 7-skill levels is obtained in the same manner as in training priority category A and B skills.

7-6. Enrollment in CDCs. The Dual Channel OJT Program requires that airmen training to the next higher skill level through formal UGT use self-study courses geared to specific AFSs, if they are available. The requirement is based on the fact that carefully planned and prepared self-study courses enable the trainee to attain the required AFS knowledges with minimum direction and assistance from the trainer. This method provides the trainer more time and opportunity to conduct the job proficiency training necessary to increase the trainee's skills. The steps in CDC enrollment and completion are as follows:

ch1

a. Determine Appropriate CDCs for UGT. The AFSC listing of mandatory CDCs in The ECI Catalog and Guide for Extension Course Administration is the source for determining the appropriate CDCs for upgrade training, to include retraining between AFSC shredouts. added

b. Request Extensions of CDC Completion Time Limit. ECI cancels the enrollment of an airman who has not completed a CDC within 12 months after enrollment, unless an extension has been granted. Squadron OJT managers must monitor the progress of each trainee and ensure that justifiable extensions are requested when the completion time is likely to exceed the limit. Trainees must complete a minimum of one volume each 30 days unless unusual circumstances prevail. When such circumstances occur, the immediate supervisor makes a remark in AF Form 623a to explain the situation. To ensure satisfactory progress, group study classes are conducted when necessary. Extension of the 12-month maximum time limit is requested when local units determine that students justifiably require more than 12 months to complete mandatory CDCs. The squadron OJT manager requests an extension of this limit and sends it to the ECI to arrive not later than the 12-month expiration date. ANG and AFRES trainees must complete one volume between each scheduled monthly training period unless unusual circumstances prevail. When an ANG or AFRES unit determines that a CDC requires two monthly training periods for volume completion, the supervisor may allow this time period. Care should be exercised to ensure that ECI time limits for course completion are not exceeded.

*c. What To Do Whan a CDC Is Not Available. In all cases, if a CDC is not available when an airman is placed in UGT, his or her OJT to this particular skill level is planned and administered using the study and technical references listed in the STS. When an appropriate CDC is not available, STS SRs and TRs are used to satisfy the knowledge requirement for award of an appropriate skill level AFSC. Completion of study of the SRs and TRs must be documented on the STS or JPG by circling the requirement code key and indicating the date started and date completed. The trainee completes all SRs and TRs that are indicated by an upper case letter, plus those task knowledge items applicable to his or her duty position. When the SRs and TRs list publications not readily available due to a limited distribution code, only those publications with a distribution code of F and applicable technical publications relative to the equipment assigned to the unit are mandatory for skill level upgrading. It is not necessary to indicate study references used for proficiency training when STSs list 1F-XXX-X or applicable TOs. The type weapon system, such as F-4, B52, and so forth, should be identified on the cover page of the JPG; thereafter, the general publications will refer to the weapon system identified. However, supervisors must enter the references used for knowledge training when they are in addition to those listed in the STS, and when a CDC is not available. In this case, enter references directly on the STS. No trainee is required to enroll in a CDC that becomes available after the date he or she is placed on UGT. NOTE: When the STS lists multiple references, supervisors circle the reference applicable to the duty position. Once a trainee is enrolled in a CDC, he or she is not enrolled in same CDC, which has been subsequently revised, nor is the trainee delayed in training to await publication of a CDC being revised.

d. What To Do When a CDC Becomes Available. When an appropriate CDC becomes available after an airman is placed on UGT, the supervisor informs the airman of the fact and urges him or her to voluntarily enroll in the course through education services.

7-7. CDC Study Sequence. The trainee studies the volumes of his or her CDC in a predetermined sequence. The objective of this procedure is to establish the closest possible relationship between career knowledge development and job proficiency development. The trainee and the immediate supervisor establish a sequence to allow concurrent development of knowledge and skill.

a. Formal Course Graduates. Graduates of formal basic courses on UGT to the 5-skill level must complete the 5-level CDC, including successfully passing the CE before they are eligible for award of the 5-skill level AFSC.

b. Five- and Seven-Skill Level. Trainees are not normally required to retake CDCs that they have previously completed. However, if major changes have occurred in the specialty or the CDC, the supervisor may require the trainee to reenroll. In those cases where airmen who have previously completed the required CDCs are entered into UGT, annotate the AF Form 623a to indicate previous completion of the requirement. NOTE: AFRES trainees are required to complete the current CDCs each time they are entered into upgrade training.

c. Separate 7-skill Level. In some career field ladders, separate 7-level CDCs are prepared. When these courses are available, all airmen in formal UGT (or retraining) to the 7-level must enroll in and complete the applicable CDC before they are eligible for award of the 7-level.

d. Management Training:

(1) The completion of management training is a prerequisite to upgrading to the 7-level of any AFS. This requirement is met by the successful completion of any one of the following courses:

(a) Extension Course Number 9, Command NCO Academy Correspondence Course.

(b) An accreditied NCO Academy or Leadership course, as defined in AFR 50-39, Noncommissioned Officer Professional Military Education.

(c) A base level accredited Management Course for Air Force Supervisors (Management I).

*(d) Phase II PME. (Resident Course or ECI Course 11, USAF Supervisors Course)

NOTE: Even though Management I, ECI Courses 7b and 0006 are no longer available, they still satisfy the requirement for management training. ANG/AFRES personnel with a 7- or 9-level PAFSC, entered into retraining without prior management training, are required to complete management training prior to award of a new 7- or 9-level AFSC. Satisfactory completion of Squadron Officer's School (SOS) in residence or completion of ECI Course 2E/2F or 8, are acceptable substitutes for 7-level management training.

*(2) For ANG and AFRES personnel, completion of an NCO leadership school; NCO Academy; ANG leadership school parts 1 and 2; NCO Academy phase I and II courses; ECI Courses 6, 7b, ECI Courses II or 9; Command NCO Academy Correspondence Course; or part I, Management Supervisors meets the management training required for NCOs in 7-level UGT. ECI course 8 may be used in lieu of the courses above for those eligible.

***7-8. Relationship of CDC to Upgrading Action.** When an airman successfully completes the appropriate CDC and meets all other mandatory requirements for award of AFSC, he or she is considered for upgrade action. When an airman has not been enrolled in the CDC or cannot satisfactorily complete the CDC on retesting, he or she may be considered for upgrade action by waiver of this requirement. Requests for waiver must be according to AFR 35-1. The squadron commander must thoroughly review the training difficulties prior to requesting CDC waiver. A waiver should be considered only when warranted by unusual or exceptional circumstances. AF Form 623a must contain a summary of circumstances when a trainee is upgraded based on CDC waiver. An airman whose performance does not warrant a waiver is considered for only one reenrollment in the CDC. The commander evaluates the trainee's potential to progress after a two time CE failure and documents the findings on an AF Form 623a.

7-9. Reporting Completion of CDCs. Results of CEs are reported (by ECI) on ECI Form, Report of Course Examination, as "satisfactory" or "unsatisfactory" (see attachment 3) through the squadron OJT manager. NOTE: The numbers printed on ECI Form, Report of Course Examination, are not item numbers, but are study reference guide (SRG) or learning objectives (LO) numbers which correlate with the CE test items. These numbers tell the trainer the specific areas in which the student is weak and in need of review study. After review study in the indicated areas and another overall review, the student who received "unsatisfactory" retakes the CE (within the 12 month enrollment time limit). The student receives still further feedback on weak areas through receipt of the second ECI Form, Report of Course Examination. ECI does not process retakes on VREs. Document review training in deficient areas of CDC on ECI Form, Report of Volume Review Exercise, with the date started, date completed, and signature of the supervisor and the trainee (see attachment 3). NOTE: Review training is required when one or more items is answered incorrectly. (For ANG/AFRES, use table 2-7, rule 1.)

7-10. Disposition of CDC Volumes. Trainees are required to retain CDC volumes for further study reference.

7-11. Relationship of CDCs to Apprentice Knowledge Tests. Apprentice Knowledge Tests (AKTs) are developed by Air Training Command. AFR 35-8, Air Force Military Personnel Testing System, is the directive governing the development and administration of AKTs. The basis for programming the development of an AKT is essentially the same as for preparing a CDC; hence, AKTs are available for practically all Air Force specialties. If no CDC is available, airmen must satisfactorily complete the AKT prior to upgrade to the 3-level. Trainees prepare for the AKT by studying the references shown in the STS. This knowledge training must be completed prior to requesting the AKT.

7-12. Local Administration of the CDC. Self-study by the trainee is a basic principle of the career knowledge part of the OJT program. Trainees, who prove capable, can proceed largely on their own. Supervisor's efforts can then be concentrated on those who need their attention. The Air Force must make the best possible use of all personnel. Voluntary "dropouts" are not permissible in the OJT program. Each airman must be trained to perform satisfactorily to the limits of his or her ability. For specific enrollment procedures, participation rules, and general administration of the CDC, refer to The ECI Catalog and Guide for Extension Course Administration.

7-13. Counseling CDC Students. In counseling, the supervisor puts his or her special skills and knowledge to work. Much of the material in chapter 9 relates closely to the counseling of the newly enrolled CDC student, particularly the material dealing with "Human Relations" and "Training Principles." Intelligent counseling at this stage can get the student off to a good start, clarify questions, and give him or her a knowledge of how the CDC fits into the dual channel training program. The ECI instruction brochure, Your Key to Career Development, furnished with the course package, is tailormade to fit this important first step. The counselor should emphasize the following points:

a. Essentiality of Course for Career Progression. Explain to the student that the career development course is designed only to give the knowledge needed to perform effectively and to progress in the chosen career area. How this knowledge is translated into performance will determine his or her skill on the job. To make clear the dual channel program of upgrade training, study figure 1-1.

b. ECI's "Your Key to Career Development." Go through this key with the student. In particular, discuss your schedule for completion of course requirements. This key is designed as a checklist for the airman on how to study his or her CDC. As the student reads it, he or she will become familiar with the ECI feedback and reinforcement system of learning. The student will also learn how to use the autoinstructional devices of the CDC which are developed by ECI to implement the system.

c. Completion Schedule and Course Materials. Before issuing any CDC material, set up a course completion schedule. Enter this schedule on AF Form 1096, CDC Status Record. Provide a duplicate copy to the squadron OJT manager. You may desire to enter this schedule on an AF Form 1320, Training Chart, especially when several trainees are enrolled in the same CDC. The time ECI allows for the completion of a CDC is 12 months, including the course examination and one retake, if required. Such a schedule permits the OJT manager to be realistic about the training needs of the unit. Before issuing any course materials, refer to "Your Key to Career Development." Go through the sections relative to CDC materials with the student and check off the course material items. This process familiarizes the student with the course and how to use it. Place particular emphasis on the study reference guide.

*d. Study Reference Guide. ECI prepares a study reference guide (SRG) which is a detailed, numbered outline of the entire course. The SRG identifies information areas by volume, topic, and page. SRGs are not applicable to CDCs developed using the BOF format. This guide is included with the course materials. In the workbook format, it is included in the workbook. Before the preparation of VREs and CEs, all items are posted against guide numbers of the guide. This is done to make sure that the VRE covers all materials in each volume.

7-14. CDC Formats. CDCs are published in two formats, the adaptive programmed learning package and the behavioral objectives format (BOF). The latter applies instructional systems development to correspondence course materials. All new and revised CDCs are being developed in the BOF. This conversion of all CDCs to the BOF will take several years.

a. Adaptive Programmed Learning Package. The adaptive programmed learning package is the total of the learning aids provided to the CDC enrollee. The package includes the course volumes, SRG, CREs, VRE, criterion references (CRs) supplements, etc. In this format, the SRG CREs and VREs are combined in a workbook.

b. Behavioral Objectives Format. In BOF, each volume is built around a series of sequentially numbered learning objectives (LOs). Each objective is followed by a brief discussion section that is, in turn, followed by exercises that fulfill the objective. These exercises replace the CREs that are included in the workbook for the programmed learning package. BOF also does away with the SRG, since the references are to numbered objectives.

c. Supervisor Responsibility. The materials in both CDC formats are designed so that the average student can acquire the desired knowledge through self-study at his or her own best pace. For effective learning to take place, the immediate supervisor and trainee must use the package in the intended manner. ECI depends wholly upon the supervisors and trainers worldwide, as the "holders" of the students' learning process. Therefore, it is the immediate supervisors' responsibility to make sure that the ECI autoinstructional devices are properly administered and provided to the trainee in the correct sequence for learning.

***7-15. Use of Course Materials.** For best effectiveness in learning, issue the CDC materials to the trainee in the sequence in which they will produce the desired learning outcomes. Each individual will post and update all CDC materials as indicated by ECI. The following represents the manner in which ECI course materials were designed to be used:

a. Issuing Sequence. After reviewing "Your Key to Career Development" with the trainee, provide him or her with the first volume, first volume review exercise, and the key for study reference. If the course is in workbook format, also provide the workbook for that volume.

*b. Chapter Review Exercise (CRE and LO). The first feedback and reinforcement loop of the programmed learning package must be the study of the chapters and the accomplishment of the CREs or LOs. The supervisor directs the trainee to study each chapter of the volume and to accomplish the CREs or LOs and compare the responses with the model answers provided. The amount of time for this study must be determined by the supervisor, based on such factors as the student's past experience, size of the volume, number of chapters, difficulty of subject, student's best pace, etc.

*c. Volume Review Exercise (VRE). On the trainee's completion of the first feedback loop (the CREs or LOs), review his or her work. Require "open book" completion of the VRE. If supervised study time is desired, be sure to provide as many periods of study as required. Remember that the VRE is a teaching device, not a "test," and must be given "open book." In the interest of educational effectiveness and standardization, there can be no deviation from this practice.

d. VRE Feedback:

(1) When the student completes the VRE, the squadron OJT manager immediately forwards the answer sheet to ECI, and the student begins study of the second volume. As each VRE feedback postcard is returned, the supervisor reviews the result with the student, identifying the areas for restudy. Course materials in the workbook format use two reference systems: the text page number, and the SRG code number. The page number or the SRG code number appears in parentheses immediately after the VRE item number and indicates the subject area on which the item is based. Thus, the student feedback consists of not only the item missed, but also information on what area to restudy (see attachment 3). For courses in BOF, the student is guided to the area of study for each VRE item by reference to the LO, against which the item was written. The LO number is printed in parentheses on the VRE, immediately following the VRE item number. Since the LO referencing system does not affect materials already in print, there's a transitional period in which all three formats are in the field. Trainees must read the directions on the VRE cover to determine which format is applicable for their CDC volume (see attachment 3).

(2) Students showing poor progress on VREs must be given special attention and considered for special help through supervised study. However, the supervisor must remember that receiving the results of each VRE does not complete this phase of the learning process. Use ECI Form, Report of Volume Review Exercise, to close the feedback loop by requiring the students to restudy the indicated areas of weakness. Document any review training on ECI Form, Report of Volume Review Exercise.

e. Group Study. A complete review of CREs and VREs (including the feedback form) is recommended before the trainee takes the course examination (CE). If a group study class is considered advisable for a comprehensive review of the course, place emphasis on the areas in which the greatest number of students revealed weakness. You can arrive at these areas by putting a check or tally mark beside the LO numbers or subject area references for missed VREs. The number of such marks against each LO number or subject area will give an approximate indication of how much to emphasize that area during the review. Do not use group study classes to teach or complete the VREs or CEs.

f. Course Examination (CE). This examination indicates whether a trainee has satisfactorily or unsatisfactorily completed the CDC. ECI awards certificates based on the result of the CE. However, ECI also uses this instrument as a third feedback loop for further study of the course, based on weak areas indicated by the examination results. ECI Form, Report of Course Examination, is the feedback card for the CE. The examination items missed by the students are not identified; instead, the computer identifies study areas by SRG code numbers or LO numbers for the examination item missed. Again, the student and supervisor must use the feedback to close the loop and improve the student's knowledge, by review of indicated "weak" areas. Document any review training on ECI Form, Report of Course Examination. ECI provides one retake examination (see paragraph 7-9) for unsatisfactory achievement, with another feedback loop on ECI Form, Report of Course Examination (see attachment 3).

7-16. AF Form 1096, CDC Status Record. The AF Form 1096 is maintained by both the unit OJT manager and the immediate supervisor of the trainee. While the entries on the form are self-explanatory, special guidance is provided for unusual circumstances.

a. Section I. When the trainee is enrolled in more than one CDC, all currently required CDCs will be entered in this block (for example, the CDC number 1, number 2, etc.). Also, the date that the CDC is ordered and received will be prefixed in the same manner to correspond with the CDC No. block.

b. Section II. Enter each CDC volume or unit for ECI Course 9. The estimated completion date will indicate the optimum date that the trainee will complete the volume or unit. The estimated completion date for each volume will be entered as it is assigned for study. However, a course completion schedule will be established and entered when the first volume is assigned for study. The date completed will be the date the trainee completes the VRE.

c. Section III. The career development course number will be entered in each block. The date administered will be the date the course examination is administered.

*NOTE: The use of this form is optional when the ECI automated feedback products are available. However, pending refinement of the automated feedback system the AF Form 1096, Section II will continue to be used to document course and volume completion schedules.

***TABLE 7-1**

CAREER DEVELOPMENT COURSE ADMINISTRATION

STEP	A	B
	Processing Stage or Situation	**Routine Action**
1	Airman placed in UGT status.	CDC availability is determined.
2	CDC *is not* available.	Airman is briefed on use of STS study references, by supervisor.
		Airman completes study of STS references, is tested by supervisor and certified on JPG. (AFR 50-23, para 7-6c).
3	CDC is available.	Base OJT enrolls airmen in applicable CDC.
4	CDC is received.	Unit OJT manager issues CDC material to immediate supervisor.
5	CDC issued to supervisor.	Supervisor and trainee inventory course material.
		Supervisor briefs trainee on proper use of material utilizing AFR 50-23, para 7-13, and the ECI key to Career Development.
		Trainee makes all necessary course corrections. Supervisor checks course corrections and issues first volume.
		Immediate supervisor establishes target course completion schedule and annotates AF Form 1096 (maintenance units use MMICS).
6	Trainee issued CDC volume and workbook.	Supervisor annotates start date on AF Form 1096 (maintenance units use MMICS).
		Trainee reads entire volume.
		Trainee studies volume chapter by chapter and answers chapter review exercise (CRE) questions or learning objective exercise (LOE) questions (giving a reference) in the most effective manner determined by the supervisor.
7	Trainee completes chapter review or learning objective exercise.	Supervisor reviews all exercise questions for accuracy and compares them to ECI provided answers for content.
		Trainee corrects all erroneous answers and supervisor rechecks.
8	Trainee completes volume review exercise.	Trainee answers volume review exercise questions by circling choice of available responses.
		Supervisor reviews all exercise questions for completion.
		Unit training administers VRE under the provisions of AFR 50-23, table 4-4, duty 18, checks answer sheet for accuracy and mails it to ECI. Annotate AF Forms 1096 or (MMICS).
		Supervisor issues next volume.
9	Base OJT receives ECI report of VRE completion (2 copies).	Report is reviewed and appropriate comments entered (if applicable).
		Report is forwarded to unit for action. (Both copies, one for OJT Manager and one for inclusion in the AF Form 623).
10	Unit receives ECI report of VRE completion.	Unit training annotates score on AF Form 1096 or (MMICS) indicates whether or not review training is required and forwards to supervisor. (Commanders or the unit training manager comments on computer product if desired and/or appropriate.)
		Supervisor annotates necessary forms and conducts review training IAW AFR AFR 50-23, para 7-15d. (Minimum acceptable training consists of correcting incorrect response, reading the entire area in which the question is located and a verbal question and answer session.)
		Supervisor and trainee certify proper completion of review training on ECI report of VRE completion.
11	Trainee exceeds volume completion TIME LIMIT of 30 days per volume.	Supervisor analyzes reason for slow progression, counsels trainee and makes AF Form 623a entry IAW AFR 50-23, table 4-5, duty 10 and para 7-6b.
		Supervisor adjusts estimated completion dates on AF Form 1096 or MMICS and informs unit training. Trainee placed in supervised review.

(Table continued on next page.)

TABLE 7-1 (CONTINUED)

STEP	A	B
	Processing Stage or Situation	Routine Action
12	Course Examination arrives on station.	Base OJT notifies unit, unit notifies supervisor and trainee.
		Supervisor conducts complete review of entire course with trainee, emphasizing weak areas (AFR 50-23, table 4-5, duties 18 and 24).
		Unit training schedules trainee for examination administration.
13	Base OJT administers course examination.	Trainee reports to test area with AF Form 623 and ID card.
		Test proctor checks record for review certification and allows trainee to sign in if everything is in order.
		Test proctor checks ID, issues test and gives test briefing.
		Trainee takes test.
14	Base OJT receives ECI report of course examination.	Report is reviewed and appropriate comments entered (if applicable).
		Test booklet is removed from safe and destroyed.
		Report is forwarded to unit for action.
15	Unit receives ECI report of course examination (SATISFACTORY).	Unit training annotates score on AF Form 1096 or MMICS, indicates necessary review training and forwards to supervisor.
		Supervisor annotates necessary forms and conducts review training IAW AFR 50-23, para 7-15d. (Minimum acceptable training consists of carefully reviewing each weak area and a verbal question and answer session).
		Supervisor and trainee certify proper completion of review training on ECI report of CE result.
16	Unit receives ECI report of course examination (UNSATISFACTORY).	Unit training annotates score on AF Form 1096 or MMICS, indicates review training required and forwards to supervisor.
		Supervisor annotates necessary forms, evaluates the trainee and test results and documents findings and recommendations on AF Form 623a IAW AFR 50-23, table 4-5, duty 10.
		Trainee scheduled for reading test, if appropriate.
		Trainee placed in supervised review training, if appropriate.
		Supervisor conducts review training IAW AFR 50-23, para 7-15d. (Minimum acceptable training consists of study of each weak area, total course review and a verbal test.)
		Supervisor and trainee certify proper completion of review training on ECI report of CE.
		If second failure, unit commander evaluates total training program, interviews supervisor and trainee and documents findings and recommendations on AF Form 623a, IAW AFR 50-23, table 4-2, duty 6 and AFR 35-1, para 6-18. Commander determines if trainee should be reenrolled.
		Base OJT will review records and interview trainee to ascertain reason for failure and to insure all required action has been completed and documented.
		Trainee scheduled for retake examination, reenrollment, CDC waiver upgrade or removal from training as applicable.

Chapter 8

ADMINISTRATION OF OJT PROGRAMS

8-1. Planning and Programming. This chapter contains information and guidance for supervisors who are responsible for the administration and supervision of OJT programs.

a. Identifying OJT Requirements. Applying the rules and procedures listed in the preceding chapters to the manning and personnel situation of any given unit identifies the specific OJT requirements of the unit. In the identification process you must identify both the current and the projected OJT requirements of the unit concerned. The final step is to plan and program the accomplishment of these requirements so that they are met on time.

b. UGT Requirement. An example illustrating the foregoing procedure is the UGT requirement, since this requirement normally represents the greater scope of the unit OJT program. Unit manning documents (UMDs) identify and authorize the AFSs required to accomplish the unit mission. These documents authorize the assignment of personnel with a certain skill level.

c. Mission Accomplishment and Training. Commanders must often accomplish their missions with unqualified people or with people who have only the minimum qualifications. The need for a planned OJT program then becomes obvious. The problem of simultaneously carrying out a critical mission and conducting an OJT program reveals the need for careful and advanced planning. Plans should answer such questions as:

(1) Who should be trained?

(2) For which jobs should training be conducted? NOTE: To answer the first two questions, compare the UMD authorizations with the qualifications of personnel assigned or projected for assignment.

(3) When should training be started and completed? NOTE: To answer the third question, determine the dates that skilled personnel requirements of the unit become critical; then program training accordingly.

d. Planning Future OJT Requirements. There are many ways to project actions that will subsequently affect the unit and generate specific OJT requirements. Since it is impractical to identify all documents and reports involved, only the general nature and purpose of these documents and reports are described here.

(1) Numerous documents exist that project future mission requirements of all echelons of command. Particularly significant are documents that project basic changes in mission requirements and those that reflect substantial changes in the manning and personnel status.

(2) All commands use a system of personnel forecasts involving numerous reports that predict the personnel situation of any given unit well in advance. Of particular significance is the consideration of projected gains and losses. Important future needs for OJT become apparent by comparing authorized skill levels with those skill levels that are to be both lost and gained through personnel turnover.

(3) The UMD system is predictive in nature, since it reflects the authorized skill requirements of a unit, including changes, sufficiently in advance to permit the anticipation of new OJT requirements.

(4) The preceding description of documents and reports is by no means all-inclusive; there are many ways to anticipate OJT needs and to avoid being forced into a crash program at the last minute.

8-2. Status of Training. Once the OJT program of a unit is planned, organized, and scheduled, you must remain aware of its actual status. This makes it possible to measure progress toward meeting the intended objectives of the program and shows inadequacies in the OJT program in sufficient time to make necessary adjustments.

a. Consolidation of Training Status. Although AF Form 623 indicates the status and progress of individual training, there is a further need to consolidate the individual's training record into a complete program status at any given echelon. At the higher echelons, consolidated reports, charts, and other devices serve this purpose.

b. Training Chart. At the operating levels, a recommended device is a chart such as the AF Form 1320 shown in figure 8-1. This chart permits the listing of OJT trainees within a section. It also provides for a listing of the specific elements of the AFS in which they are being trained and a means for recording the progress of training. The reverse side of AF Form 1320, also shown in figure 8-1, gives instructions for completing the form. The AF Form 1320 thus provides a single means of indicating the complete scope, nature, and progress of the OJT program within an operating section.

c. Evaluating the OJT Program. Obviously, the adequacy of a unit OJT program cannot be determined by a chart alone. That is why all of the other means of evaluating an OJT program, discussed in this regulation, must also be used.

8-3. Personnel Actions. Personnel who administer or supervise OJT programs must have a thorough understanding of the procedures for entering airmen into or removing them from UGT status (see chapter 2). They must also be able to apply those procedures to the local situation.

a. Preparing Documents. Details for preparing the following documents used for entering airmen into or removing them from UGT status are contained in the corresponding Air Force publications.

(1) Appropriate Orders - AFR 10-7, Administrative Orders.

(2) AF Forms 2095, 2096, and AF Form 2097, Classification Board Action - AFM 30-130, Mechanized

Personnel Procedures.

b. Flow of Personnel Actions. The flow of personnel actions in UGT is shown in table 8-1. For each processing stage or situation, there is a resultant or related action. Examine and analyze the processing stage or situation in column A; then read the resultant or related action in column B.

8-4. Requesting Waiver of AFR 39-4, Airman Retraining Program. Waivers of AFR 39-4 may be requested when it is in the best interest of the Air Force and fully justified. Accordingly, personnel who manage and supervise OJT programs must be aware of the provisions of AFR 39-4 relating to the proper procedures for requesting waivers. Requests for retraining and waivers are approved or disapproved by the agency shown in the appropriate tables in AFR 39-4.

8-5. Tips for OJT Supervisors. Helpful suggestions are provided at each level of supervision in the OJT program, based on the experience of other people. These can be a big help to the newly assigned supervisor.

a. CBPO OJT Managers. Acquire a knowledge of the USAF Integrated Training Program as outlined in PTT documents and plan accordingly.

(1) Keep abreast of all directives and documents pertinent to OJT, including the status of all CDCs and STSs pertinent to your organization.

(2) Be sure that any local OJT directives you prepare are positive, direct, and brief. Avoid loopholes. Define organization policies clearly and spell out administrative details for operating the program.

(3) Hold monthly meetings with all subordinate unit OJT managers. Include the officer who has the responsibility for the OJT program. Discuss policies, problems, office instructions, and provide training for OJT personnel. Work out plans for putting good ideas into effective use. Keep minutes of these meetings to provide for continuity and uniformity.

(4) Visit squadron and section training personnel as often as possible. Interview trainees to determine program effectiveness.

(5) Determine the need for OJT advisory services. Assist in selecting key personnel to attend appropriate courses. Require only the necessary minimum of records, reports, and charts to be maintained throughout the organization.

(6) Maintain an open door policy. Keeping your own door open, as well as making visits, promotes good relations.

(7) Ensure constant, enthusiastic support at the squadron section levels.

b. Squadron OJT Manager. Ensure that all actions conform to current OJT directives.

(1) Keep the squadron commander constantly aware of the OJT program.

(2) Visit each section at least every 180 days and know its current training status. The personal interest you show during these visits emphasizes the importance of the OJT program.

(3) Require only the necessary minimum of records and reports.

c. Immediate Supervisors. Understand fully the control and policy features of all OJT directives relating to your operation.

(1) Constantly evaluate OJT needs of the section. Ensure that personnel are placed in training according to chapters 2 or 6 of this regulation.

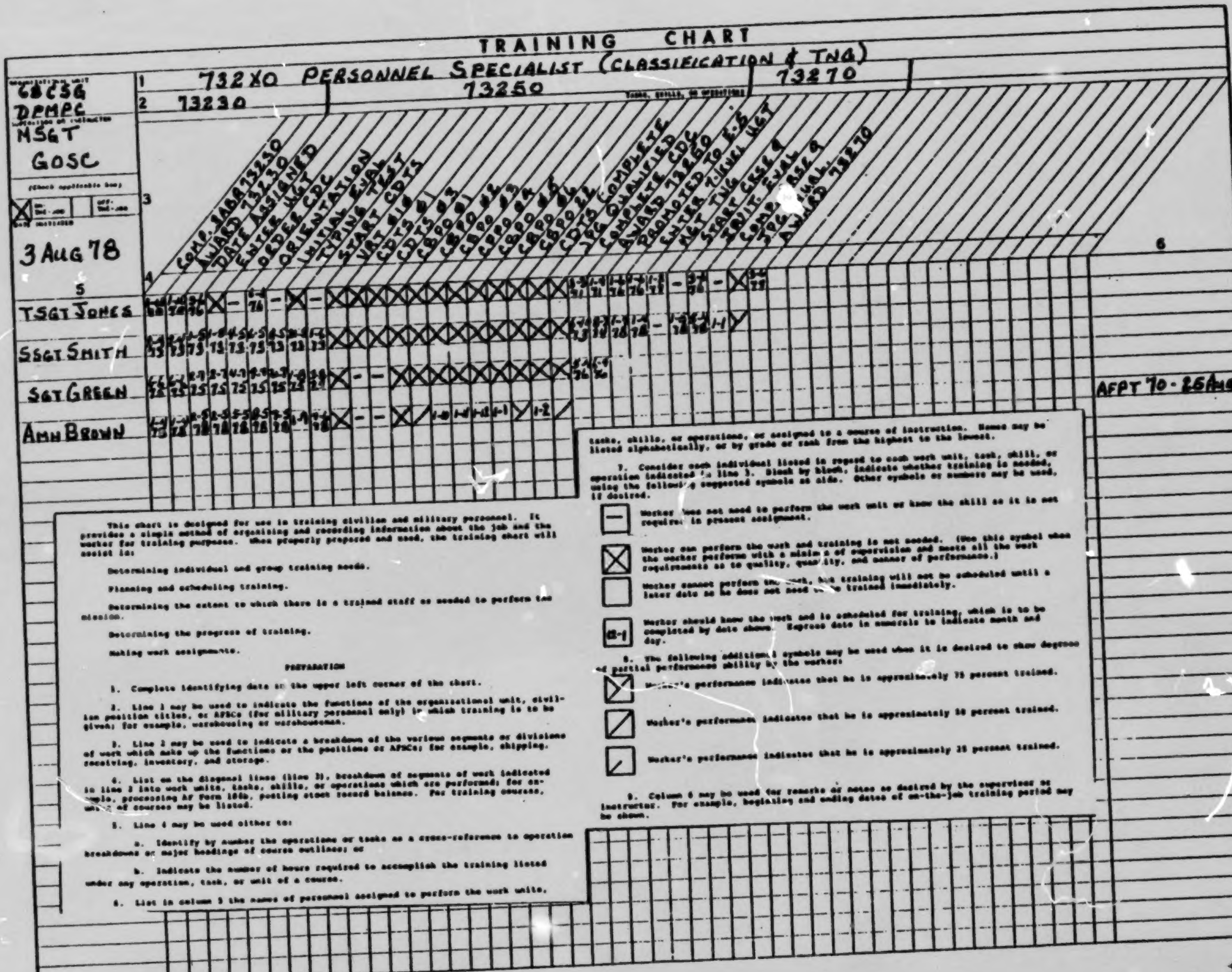
(2) Know how and when to certify completion of training tasks on JPGs.

(3) Select qualified trainers. Perform training yourself where possible and practicable.

(4) Be sure each trainee uses his or her CDC and JPG.

(5) See that trainees are upgraded as soon as they complete their UGT.

8-6. AF Form 1096, Training Actions Required. This form is designed as an all-purpose form to aid OJT managers at all levels in routine notifications of actions related to the conduct of the OJT program. The form contains preprinted statements concerning VREs, course exams, CDCs, reading tests, notification of monthly OJT meetings, etc. There is also a block for the manager to use to specify actions not listed on the form. The form is self-explanatory and may be filled in by typewriter or by hand.



TRAINING CHART

1 732X0 PERSONNEL SPECIALIST (CLASSIFICATION & TNG)

2 73230 — 73250 — 73270

68CSG
DPMPC
MSGT
GOSC
☒ ☐
3 AUG 78

3
COMP. 3ABR73230
AWARD 73230
DATE ASSIGNED
ENTER UGT
ORDER CDC
ORIENTATION
INITIAL EVAL
TYPING TEST
START CDTS
VAT #1
CDTS #1
CDTS #3
CBPO #1
CBPO #2
CBPO #3
CBPO #4
CBPO #5
CBPO #6
CBPO #7
CDTS COMPLETE
JPG QUALIFIED
COMPLETE CDC
AWARD 73250
PROMOTED TO E-5
ENTER 7-LEVEL UGT
MGT TNG
START CBSE 9
INIT. EVAL
COMP. CBSE 9
JPG EVAL
AWARD 73270

4

5
TSGT JONES
SSGT SMITH
SGT GREEN
AMN BROWN

6
AFPT 70 - 25 Aug

This chart is designed for use in training civilian and military personnel. It provides a simple method of organizing and recording information about the job and the worker for training purposes. When properly prepared and used, the training chart will assist in:

Determining individual and group training needs.

Planning and scheduling training.

Determining the extent to which there is a trained staff as needed to perform the mission.

Determining the progress of training.

Making work assignments.

PREPARATION

1. Complete identifying data in the upper left corner of the chart.

2. Line 1 may be used to indicate the functions of the organizational unit, civilian position titles, or AFSCs (for military personnel only) in which training is to be given; for example, warehousing or warehouseman.

3. Line 2 may be used to indicate a breakdown of the various segments or divisions of work which make up the functions or the positions or AFSCs; for example, shipping, receiving, inventory, and storage.

4. List on the diagonal lines (line 3), breakdown of segments of work indicated in line 2 into work units, tasks, skills, or operations which are performed; for example, processing AF Form 106b, posting stock record balance. For training courses, units of courses may be listed.

5. Line 4 may be used either to:

a. Identify by number the operations or tasks as a cross-reference to operation breakdowns or major headings of course outlines; or

b. Indicate the number of hours required to accomplish the training listed under any operation, task, or unit of a course.

6. List in column 5 the names of personnel assigned to perform the work units, tasks, skills, or operations, or assigned to a course of instruction. Names may be listed alphabetically, or by grade or rank from the highest to the lowest.

7. Consider each individual listed in regard to each work unit, task, skill, or operation indicated in line 3. Block by block, indicate whether training is needed, using the following suggested symbols as aids. Other symbols or numbers may be used, if desired.

—	Worker does not need to perform the work unit or know the skill as it is not required in present assignment.
☒	Worker can perform the work and training is not needed. (Use this symbol when the worker performs with a minimum of supervision and meets all the work requirements as to quality, quantity, and manner of performance.)
☐	Worker cannot perform the work, but training will not be scheduled until a later date as he does not need to be trained immediately.
8-1	Worker should know the work and is scheduled for training, which is to be completed by date shown. Express date in numerals to indicate month and day.

8. The following additional symbols may be used when it is desired to show degrees of partial performance ability by the worker:

⊠	Worker's performance indicates that he is approximately 75 percent trained.
⧄	Worker's performance indicates that he is approximately 50 percent trained.
⟋	Worker's performance indicates that he is approximately 25 percent trained.

9. Column 6 may be used for remarks or notes as desired by the supervisor or instructor. For example, beginning and ending dates of on-the-job training period may be shown.

AF FORM 1320

Figure 8-1. AF Form 1320, Training Chart (Front and Back).

TABLE 8-1

ROUTINE SEQUENCE OF ACTIONS IN UGT

STEP	A	B
	Processing Stage or Situation	**Routine Action**
1	Section determines a training need.	Section requests UGT status for airman (see note 1).
2	Squadron receives request for airman UGT status.	Squadron reviews request, determines section's ability to conduct UGT, and determines whether UGT is authorized.
3	Squadron determines UGT is authorized.	Squadron prepares AF Form 2095 or 2096 to place airman in UGT status (see note 2); squadron initiates AF Form 623 if none already exists; squadron determines CDC availability.
4	Section receives AF Form 623; airman is on UGT.	Airman is referred to squadron OJT manager for CDC enrollment; immediate supervisors complete applicable portions of AF Form 623; trainers are assigned; current STS is included in AF Form 623; immediate supervisor, using the master JPG, develops the individual JPG for the position; UGT job proficiency training is conducted.
ch1 5	CDC is available.	Squadron OJT manager enrolls airman in CDC. (See note 3
ch1 6	CDC is not available.	Airman uses SRs as specified in chapter 7
7	Airman satisfactorily completes UGT using SRs; use of SRs is recorded on JPG.	Record on AF Form 623. Request airmen training to 3-skill level be administered AKT. Supervisor recommends upgrading based on successful completion of requirements in AFR 35-1, table 6-5.
ch1 8	Airman satisfactorily completes CDC requirements and job proficiency training.	Record on AF Form 623 . Go to step 11 if AKT not required.
9	Airman passes AKT.	Testing activity notifies squadron of test results.
10	Airman fails AKT.	Testing activity notifies squadron of test results. Record on AF Form 623. If squadron determines airman should be continued in training, conduct review training and request airman be retested. If squadron determines airman should not be continued in training, request airman be withdrawn from training.
11	AKT not required (see note 4).	Section prepares AF Form 2096 and sends to CBPO (see note 2).
12	Airman fails AKT when retested.	Second AKT failure requires mandatory classification board action according to AFR 35-1.
13	Airman does not complete job proficiency training.	Arrange for additional job proficiency training or remove airman from UGT. In case of physical or mental inability to complete training, section requests squadron to withdrawn airman from UGT.
14	Airman twice fails CDC CE.	The commander must evaluate the trainee according to AFR 35-1, paragraph 6-18.
15	Squadron receives request to withdraw airman from UGT.	Squadron prepares AF Form 2096 requesting withdrawal of airman from UGT, and forwards it to CBPO (see note 2).
16	Airman is recommended by the immediate supervisor, satisfactorily completes CDC or other approved training material, is certified by the supervisor as demonstrating proficiency on the job, and satisfies AFRs 35-1 and 39-1 criteria for upgrading. Section prepares AF Form 2096 according to AFM 30-130, volume II and forwards upgrade request to squadron.	Squadron receives AF Form 2096, authenticates it, attaches the AF Form 623, and forwards them to the CBPO for classification action.

(Table continued on next page.)
(See notes at end of table.)

TABLE 8-1 (CONTINUED)

STEP	A	B
	Processing Stage or Situation	Routine Action
17	CBPO receives AF Form 623 and 2096, reviews AF Form 623 for completion of AFR 35-1 and AFR 39-1 requirements, takes classification action, and returns AF Forms 623 and 2096 to squadron.	Squadron receives AF Forms 623 and 2096 and returns them to section. The immediate supervisor records action by making appropriate entries in AF Form 623.

NOTES: 1. Specific responsibilities for personnel action vary with the squadron.

2. AF Form 2096 is issued according to AFM 30-130, volume I and II.

3. If trainee is not enrolled in required available CDC, enter explanation in AF Form 623a.

Chapter 9

HOW TO CONDUCT OJT

9-1. Supervisor's Qualifications. This chapter is intended primarily for use by immediate supervisors and trainers at the operating level after training needs have been established and personnel to be trained have been identified. The supervisor may be a commissioned officer, warrant officer, noncommissioned officer, or civilian. Each supervisor should recognize that his or her total job requires at least five qualifications:

a. Knowledge of the work.
b. Knowledge of responsibilities.
c. Knowledge and skill in improving methods.
d. Knowledge and skill in managing.
e. Knowledge and skill in instructing.

NOTE: A summary of what these qualifications mean and how they are acquired is presented in table 9-1.

9-2. Human Relations. A supervisor gets results chiefly through directing the efforts of other people. Best results are obtained when good human relations exist. For that reason, the section supervisor, the immediate supervisor, and the OJT trainer must understand and practice methods and techniques based on good human relations principles. Considerable emphasis is placed on human relations in various Air Force training programs, including the base-level management course conducted under AFR 50-37, Management Training Program for Air Force Supervisors. This regulation contains brief outlines of the basic principles involved in the course. These outlines serve as convenient reminders to supervisors and OJT trainers. Outlines of the foundations for good human relations and an effective procedure for handling personnel problems are provided in figure 9-1.

9-3. Training Principles. Certain basic and easily understood principles apply to all training situations. Trainers should understand and apply the principles outlined below. These principles will help trainers to improve their skill in instructing.

a. Go from the known to the unknown. Find out what the trainees know about the subject and build from there. Relate the new material to previously learned subjects. Give trainees a complete briefing on the overall program and tell them where they fit into it. Acquaint them with the goal. Make sure the part they plan in the organization is understood and make them aware that they are vital members of the team.

b. Go from the easy to the difficult. Always begin with the simple parts of a job. The knowledge that they are able to perform parts of the job after a practice period gives the trainees confidence and inspiration to learn the whole job.

c. Emphasize accuracy and understanding rather than speed, while the trainee is learning.

d. Emphasize safety at all times.

e. Clearly define the limits of the training objective and let the trainees know what is expected.

f. Present new material in short units that can be finished in one training session. Short, related training units are not so likely to confuse the trainees.

g. Be sure the trainees see the job as a whole. Fit all the short steps into the whole operation or objective.

h. Always remember that the trainees learn by doing. Put them to work as soon as they understand what they are to do. Give them plenty of practice.

i. Allow trainees to develop. They do the learning; you guide and help. Be careful not to dominate, but do not relax your supervision to a point that would allow the trainees to harm themselves, others, or damage equipment.

j. Any training procedure must make sense to the trainees. If it doesn't, change or discard it.

k. Recognize the trainees' work. Let them know how they're doing.

l. Never try to bluff. Never resort to sarcasm or ridicule.

9-4. Training Methods. An OJT trainer must assume trainer responsibility, in addition to other duties; the OJT trainer function is not considered a full-time duty. Supervisors may sometimes be required to perform as trainers. OJT trainers are expected to use effective training methods and techniques. This requirement and responsibility is contained in the specialty description of all skilled and advanced level AFSs. It follows that those who are selected as trainers must learn to perform efficiently, using methods that result in an effective OJT program. Job instruction generally involves four methods of imparting new knowledge or manual skills.

a. The Lecture. The lecture is useful for imparting information. Its effectiveness is increased when it is combined with one or more of the other instructional methods.

b. The Discussion. The discussion is a valuable training method because it promotes a two-way exchange of ideas during group instruction, when the objective is to provide background information or procedures that are of common interest to the entire group. Questioning is very useful when employing the discussion method to inform the trainees, as well as to check their grasp of the instruction. To help the trainee think through the logical steps of a new job task, phrase your questions so that they can't be answered with a straight yes or no. Use questions that begin with such words as what, who, where, when, why, and how. Questioning can be used effectively with all other instructional methods, as well as with the discussion method.

c. The Demonstration. The demonstration or showing is most effective when the training objective is the development of new manual skills. It is particularly useful in presenting the various steps of a very long operation that must be performed without stopping. The trainees are taught a part of the job, with the trainer doing the rest. After learning one step of the total job, the second step is taught, with the trainer again completing the operation.

d. The Performance. The performance is by far the most effective method to use in OJT. Trainees truly learn by doing under the watchful eye of a trainer while performing in a productive capacity. It follows that airmen on OJT should immediately be given simple jobs to do, such as cleaning or sorting parts, counting pieces, sorting papers, learning names of parts, or checking supplies. It is most practical to assign such airmen to assist others who are producing. After airmen have received training on some particular task or phase of work, they are able to do it with the desired proficiency. They should then be rotated to another task. With a progressive rotation plan, trainees grow in skill and knowledge until they are able to accomplish effectively the requirements of the duty position.

9-5. Training Techniques. Supervisors must make sure that trainers develop a set of techniques similar to the five steps which follow so that all OJT can be effectively conducted.

a. Step 1. Prepare the training situation.

(1) Make sure that the tools and equipment are on hand and in working order.

(2) See that the shop or room is available and that it is properly heated, lighted, and ventilated.

(3) See that training aids planned for use are available and in good working order.

b. Step 2. Prepare the trainees to receive job instruction.

(1) Put them at ease. This helps build confidence. The supervisor's training efforts are likely to be in vain if trainees are nervous or ill at ease.

(2) Find out what they already know about the job. Don't tell them things that they already know. Start where their knowledge ends.

(3) Gain their interest. Explain the job or operation at hand and relate that job to the work of the whole unit. This helps them realize the importance of the job.

(4) When demonstrating a job, make sure the trainees observe from the proper position. Don't have them look backwards or from an angle other than the one from which they will work.

c. Step 3. Present the operation.

(1) Tell, show, illustrate, and then question. Once understanding is achieved, have the trainees perform the task.

(2) Give only a few instructions at one time. Understanding is gained more quickly if ideas are presented gradually.

(3) Make the key points clear. These make or break the operation; to a large extent, they determine the ultimate success or failure of the training.

(4) Use available training aids when they help to put the point across. Don't use them just to fill in time. Before using any training aid, be sure that it applies directly to the subject and that it works.

(5) Be patient; remember that haste makes waste. Work for accuracy first, speed later.

(6) Repeat the job and explanation, if necessary.

d. Step 4. Try-out performance.

(1) Have the trainees do the job under observation. Then repeat the job and have them explain what they are doing, and why. Some people don't realize the importance of motions they are observing and repeating. The trainees must understand not only what, but why.

(2) Have the trainees explain the key points. Correct any errors, but do not correct in a way which will make them feel that you are not satisfied with their progress.

(3) Continue to have the trainees perform and explain until you know that they understand what they are doing.

e. Step 5. Followup.

(1) Put the trainees on their own so they will get the feel of the job by doing it. Tell them who they should go to for help, and make sure the designated individuals understand their responsibility.

(2) Check trainees' work frequently--perhaps every few minutes at the start, then every few hours. Be on the lookout for incorrect or unnecessary moves, but don't make an issue over them. Expect a few mistakes; if there are none, congratulate the trainees for a job well done.

(3) Taper off the coaching until the trainees are able to work under normal supervision. Be sure that the trainees are adhering to the approved safety practices. Safety is one of every supervisor's most important responsibilities. Make it clear, both by instruction and attitude, that, strictly speaking, accidents don't just happen--they are provoked. The cause of an accident may not always be readily apparent, but it can usually be found. Common causes include lack of skill, poor work habits, poor attitudes, and/or faulty instructions. If you discover that a trainee is having more than his or her share of accidents, and if you have eliminated faulty instruction as a possible cause, report the fact to your supervisor for action.

9-6. Task Breakdowns. Specialty training standards break down an AFS into various individual tasks and knowledges. These tasks and knowledges are required for each specialty within the ladder to indicate the extent of knowledge or degree of proficiency required for each skill level. However, many of the individual tasks and items are in themselves quite complex. The OJT trainer must break these down into a logical, systematic sequence of parts and teach each part as a complete unit. These written breakdowns of complex tasks or operations are known simply as task breakdowns.

a. Purpose of the Task Breakdown. Many OJT trainers may think they know a task when they really don't. Others may know the task so well that they neglect to clarify a point which is simple to them but confusing to the trainee. Still others may know the task so well that they do not plan how to teach it to another person.

(1) For some tasks, the breakdown may be as simple as saying to the trainee, "Do this first, this next, and then do that." However, many Air Force jobs are extremely complex. Complete performance of such jobs is overwhelming to the young and inexperienced airman.

(2) The purpose of the task breakdown is to divide the big job into easy, progressive, and teachable units. This makes it possible for the airman to learn the job in small doses, one step at a time.

(3) The degree to which a task must be broken down depends on the past experience and learning capability of the trainee. The trainer must determine when the task is broken down far enough to be easily taught and readily understood.

b. Format of the Task Breakdown. As a management device, the task breakdown consists essentially of two columns. One is titled "Important Step" and the other is titled "Key Points." A typical example of a task breakdown is illustrated in figure 9-2 for your guidance.

(1) Important Step. The steps are logical segments of the operation which advance the work. These breakdowns are not intended to be hairsplitting; rather, they are to be simple, common sense reminders of what is really important in doing a task.

(2) Key Points. Knowing what the key points are and how to pick them out quickly and easily is an important part of job instruction. They are:

(a) Hazards which may cause injury to personnel or damage to tools and equipment.

(b) Things which make or break the task.

(c) Things which make the work easier--knack, trick, feel, and special timing.

c. Preparation of the Task Breakdown. There are several procedures by which trainers may prepare task breakdowns. Their own experience and the type of task to be performed determine which procedure to follow.

(1) Some tasks may be so well understood that they can be analyzed and divided into simple, logical steps, just by thinking through the various stages of the operation. Others may be too complex to break down without going through the entire operation and making notes on the performance of each part.

(2) Sometimes trainers may have to break down a task in which they've had little personal experience. If so, they should carefully watch the motions and steps used by someone more expert in the task.

(3) In each case, the objective is to find how the trainer can best help the trainee to perform each operation safely, easily, correctly, and quickly. This involves the knacks, tricks of the trade, special timing, key points, and special information on what to look for, where to look, how to feel, and what to listen for, in each operation.

(4) Task breakdown sheets are not necessarily intended to be given to the trainee. They are for the trainer's use in clarifying and organizing his or her own thinking about the task. For this reason, it is not necessary to formalize them.

(5) All tasks are identified in a general manner in JPGs. However, the task breakdown should be prepared personally by the on-the-job trainer. As with most other operations, task breakdowns can be made easily and quickly after a little practice.

(6) Supervisors should arrange for group instructions, discussions, practice sessions, and critiques with trainers, to ensure proper preparation of task breakdowns.

9-7. Task Evaluations. Numerous types and means of evaluation are available; therefore, only a sampling is mentioned here to aid the supervisor in determining if the job is getting done. No specific format is suggested, in an effort to provide for flexibility and creativity. If further guidance is needed, consult AFM 50-62, Principles and Techniques of Instruction.

a. Checklist Method. A checklist can be prepared by using a governing directive, technical order, or task breakdown on a particular job or task, based on a pass/fail or "GO/NO GO" situation (either the job is performed correctly or it isn't). A simple "S" or "U" may be used to evaluate each step.

b. Rating Scale. Degrees of performance can be measured by using personally constructed rating scales (for example, based on a scale from 1 to 10: "1" being outstanding, "5" being average, and "10" being a total failure). Care must be taken as you construct your scale to define minor differences in levels of achievement.

FOUNDATION FOR GOOD HUMAN RELATIONS

1. LET WORKERS KNOW HOW THEY ARE "GETTING ALONG":
   a. Determine exactly what you expect.
   b. Point out ways to improve their work.

2. GIVE CREDIT WHERE CREDIT IS DUE:
   a. Look for the extra or unusual performance.
   b. Tell them while "it is hot."

3. TELL PEOPLE IN ADVANCE ABOUT CHANGES THAT WILL AFFECT THEM:
   a. Tell them why, if possible.
   b. Get them to accept the change.

4. MAKE THE BEST USE OF EACH PERSON'S ABILITY:
   a. Look for ability that is not being used.
   b. Never stand in a person's way.

HOW TO HANDLE A PROBLEM

1. GET THE FACTS--ALL THE FACTS:
   a. Review the record.
   b. Find out what rules and regulations apply.
   c. Talk with individuals concerned.
   d. Get opinions and feelings.
   e. Be sure you have the whole story.

2. WEIGH AND DECIDE:
   a. Fit the facts together.
   b. Consider their bearing on each other.
   c. What possible actions are there?
   d. Check practices and policies.
   e. Consider the objective and the effect on each individual or group and on work output.
   f. Don't jump to conclusions.

3. TAKE ACTION:
   a. Are you going to handle this yourself?
   b. Do you need help in handling the situation?
   c. Should you refer this to your supervisor?
   d. Watch timing of your action.
   e. Don't pass the buck.

4. CHECK RESULTS:
   a. How soon will you follow up?
   b. How often will you need to check?
   c. Watch for changes in output, attitudes, and relationships.
   d. Did your action help work output?

PREVENT THE DEVELOPMENT OF PROBLEMS BY ELIMINATING THE CAUSES

Figure 9-1. Human Relations.

TASK BREAKDOWN SHEET FOR TRAINING AIRMEN IN NEW JOBS	
Part: Pre-Start Check of Compressor Engine	Operation: Starting MA-1 Trailer Mounted Gas Turbine Air Compressor
Important Step	Key Points
1. Lock parking brake ON.	Parking brake lever is located at front right-hand corner of trailer.
2. Check fuel and oil lever.	-Fuel tank should be full. (Max. 80 gallon) with turbine fuel Mil Spec MIL-J-5624, grade JP-4. -Oil tank holds 4 quarts lubricating oil, Mil Spec MIL-O-6081, grade 1010.
3. Pull out static ground reel and connect to suitable connection.	-Make certain static ground reel is connected to a good earth ground.
4. Check to be sure that exhaust area is free and clear in high temperature zone.	-Perform this step before every start and before every new connection to load unit.
5. Open control panel cover.	-Make sure interlinked exhaust cover opens as control cover panel opens.
6. Clean bed of trailer unit.	-Clean after every exposure to jet blast or other unusually dusty conditions. Wipe with soft dry cloth.
7. Unwind air delivery duct.	-Inspect air delivery duct for foreign material, alignment, kinks, security of coupling.
8. Couple air delivery duct securely to load.	-Make sure the coupling end adapter is securely attached to the threaded inner sleeve. Prevent duct from dragging or scuffing. Avoid kinking of duct. Check duct for obvious damage each time it is stretched out. Never allow possibility of air delivery to a loose duct. Before moving START switch, make sure that duct is either securely coupled to load or securely stowed.

Figure 9-2. Sample Task Breakdown.

TABLE 9-1

THE SUPERVISOR'S NEEDS

I T E M	A	B	C
	When the supervisor's requirements are	this means	and this is acquired through
1	knowledge of the work	information which is required in working with tools, operating machines, processes, operations, technical skills, etc.	formal schooling, OJT experience on the job, self-study, etc.
2	knowledge of responsibilities	local policies, regulations, procedures, schedules, etc., as well as other rules established by immediate supervisors	study of local regulations and policies, requesting advice when necessary, attending briefings by immediate supervisors, etc.
3	knowledge and skill in improving methods	more effective use of materials, machines, and manpower	ECI Course 9 and base level management training programs (AFR 50-37) and experience.
4	knowledge and skill in managing	the ability to keep human relations smooth and prevent problems from arising, the ability to handle problems when they do arise	ECI Course 9 and base level management training programs (AFR 50-37). (A summary of human relations is included in this chapter in view of its importance in conducting OJT.)
5	knowledge and skill in instructing	the ability to help develop a well-trained force that works more effectively, has fewer accidents, has less equipment damage, etc., and ability to get an airman to do a job correctly, quickly, and conscientiously	study of this regulation. (Information on how to plan and conduct OJT is the principal subject of this chapter. Additional help is given in AFM 50-62. As with other skills, ability increases with practice and experience.)

Chapter 10

AF FORM 623, ON-THE-JOB TRAINING RECORD

SECTION A-GENERAL INFORMATION AND PROCESSING PROCEDURES

10-1. Training Documentation. The AF Form 623 is a comprehensive record of AFSC-oriented training. For the form to be used properly and retain its value over the entire career of an airman, it must be up-to-date, accurate, and complete.

10-2. Uses of AF Form 623. AF Form 623 is designed to contain all pertinent information necessary for management personnel to use in making decisions and to reflect the current training history of an airman at any particular time. Supervisory personnel use the form to determine whom to recommend for upgrade action, to determine when qualification training is necessary, and to make assignments or recommend personnel for positions. The primary purpose of the form is training documentation. Through this documentation, the Air Force makes sure that an airman is trained in his or her AFS to a particular standard, so that he or she can perform predictably, effectively, and efficiently. This form permits the recording of all upgrade training (UGT), lateral training, retraining conducted on the job, and career development courses and formal courses completed. This form is also used to record qualification training.

a. Completing AF Form 623 as a Training Folder. AF Form 623 is not complete until the JPG (consisting of an annotated STS, as described in chapter 6) for the appropriate AFS is included. Inclusion of the JPG in the AF Form 623 provides the data necessary for completing job knowledge and job proficiency training, and recording all qualification training. Once the JPG is inserted into the AF Form 623, it becomes an official part of the individual's training record. The immediate supervisor and trainer use the AF Form 623, along with the JPG, to maintain a cumulative record of an airman's training progress. When the trainee acquires the job proficiency recommended for a particular task on the JPG, the supervisor dates and initials the item to show completion, according to chapter 6. The trainee initials each completed item. AFR 8-13, Air Force Specialty Training Standards, and AFR 0-8, Numerical Index of Specialty Training Standards, contain information about STSs.

b. Where and How AF Form 623 Is Maintained. Because the AF Form 623 must be available to the immediate supervisor, it is maintained at the lowest level of supervision having facilities for the storage and maintenance of forms. In most cases, this is the immediate work unit. When an airman is transferred, the AF Form 623, with all appropriate current data inserted (manual or automated forms), accompanies the airman's field record group to the gaining organization. This is indicated by the decision logic tables in chapter 4, and AFM 35-44, Military Personnel Records System, chapter 2. The airman's training is continued, unless he or she is specifically withdrawn by the gaining organization. File any AF Form 20XX series or appropriate orders issued by the gaining organization to continue or discontinue training, in the AF Form 623.

c. AF Form 623a, On-the-Job Training Record Continuation Sheet. AF Form 623, prepared in one copy, is a permanent record which reflects the entire range of an airman's progression. However, it may become necessary to insert an AF Form 623a in the training record to continue a section of the AF Form 623 which has been completely filled in. When an AF Form 623a is attached to a trainee's AF Form 623, the bottom edge of the form is annotated to reflect the trainee's name and SSAN. Remove all AF Forms 623a from the AF Form 623 that are not applicable to the airman's current OJT training objective. In normal UGT, the training objective is defined by the training-to AFSC shown in section I. In qualification training, the training objective is the completion of all training requirements for the highest awarded skill level in the current duty position.

10-3. Documents Included in the AF Form 623. The use of cover sheets and index cards to ensure the order of documents may be used, if the MAJCOM OJT manager has determined that it is appropriate. Only the items listed below are authorized to be filed in the AF Form 623:

a. AF Form 1096, AF Form 1098, AF Form 2095, AF Form 2096, AF Form 2097, Classification Board Action, AF Form 2098, Duty Status Change, and special orders that have a direct influence on the airman's training; for example, entry into training, removal from UGT, upgrade action, or extensions in training time.

b. The appropriate STSs or JPGs.

c. AF Forms 623a.

d. AF Forms 797.

e. Reading and typing tests results.

*f. ECI forms, Report of Course Examination, and Volume Review Exercise. Remove these forms when the individual completes the required CDC. AF Form 1096 is also removed at this time.

g. AF Form 1034, Recurring Proficiency Training Record--571X0.

h. AF Forms in the 2400 series.

i. All AF Forms in the 30XX series that apply to the Instrumentalist Performance Requirements (IPR). The IPR is applicable only for personnel in AFSC 871X0/872X0, and is used as the JPG.

j. DD Forms 1435, Cryptographic Maintenance Training and Experience Record.

k. Data Automated Products. The procedures listed in this chapter pertain primarily to nonautomated training documentation requirements. After an approved automated training system or subsystem is implemented, the following documentation procedures apply:

(1) Forms. When an approved standardized automated product is available, it will be used in lieu of manual forms or selected parts of the manual forms described in this regulation.

(2) Maintenance of Products. Those products that duplicate AF Form 623 entries, or other training forms required by this regulation, are not required to be maintained in the AF Form 623, unless determined necessary by the MAJCOM/DP and functional user. However, those automated products that are not maintained in the AF Form 623 will be inserted in the AF Form 623 when the individual is TDY in support of an operational requirement or when departing PCS. They need not be transcribed.

l. Other documents or copies of documents that, in the opinion of the MAJCOM-SOA DCS/P (DCS/T for AFRES, DPT for ANG and ARPC/RT for MAs), are necessary to provide a complete picture of the airman's overall training status.

10-4. Reaccomplishing Unusable AF Forms 623. Do not reaccomplish an AF Form 623 for the sole purpose of transferring the information to a new form. If it becomes necessary to reaccomplish a mutilated, dirty, or illegible AF Form 623, then transfer all pertinent information (including documents stored in the form) to the new form. Under no circumstances, will an AF Form 623 be cut up and parts or pages glued, stapled, taped, or inserted into another AF Form 623. When an AF Form 623 is replaced, the squadron OJT manager (staff agency OJT supervisor) or the unit commander, verifies the authenticity of the new form by certifying in section II that the new form contains all the pertinent information that was in the previous one. Give the replaced form to the trainee.

***10-5. Airmen Who Must Have an AF Form 623.** An AF Form 623 must be maintained for each individual in grades E-1 through E-6, and for each individual in grades E-7 and E-8 who are retraining. This policy does not prevent MAJCOMs from directing the maintenance of an AF Form 623 for personnel whose duties are such that an active training record would be beneficial. These might include: EGRESS personnel, nuclear weapons technicians, instructors, medical lab technicians, etc. The following categories of personnel also need not maintain the AF Form 623:

a. Personnel enrolled in phase II medical training (see table 2-1, note 5) and AFSC 917X0, Physician Assistant.

b. Personnel possessing AFSC 871X0/872X0 and assigned to USAF Special Bands.

c. Enlisted Aircrew Members, AFSCs 11XXX with an A, K, or M prefix. The proficiency and qualification training programs for these personnel are documented according to AFR 60-1. Career knowledge training will be accomplished and documented according to AFR 50-23.

10-6. Disposition of the AF Form 623. On separation, retirement, or promotion to pay grade E-7, the AF Form 623 is given to the individual, unless it is required according to paragraph 10-5. If an E-7 or E-8 enters retraining, prepare an AF Form 623 and all records pertinent to his or her retraining status.

SECTION B-PREPARING AND MAINTAINING AF FORM 623

10-7. AF Form 623 Maintenance. Use the following instructions to standardize and correctly maintain the AF Form 623. NOTE: All entries on the AF Form 623 may be made with typewriter, ink, pencil, or any combination of the three. All units supported by Maintenance Management Information and Control System (MMICS) training subsystem, or AFRES training qualification record (TQR), need not maintain section I (except for trainee's name in section I and the supervisor's name in section II) through V of the AF Form 623, for individuals whose records are loaded to the MMICS or TQR. No action needs to be taken to delete, erase, or in any way alter the information contained on the existing AF Form 623.

10-8. Section I, Identification Data:

* a. Front Page of Form. Enter the trainee's last name, first name, middle initial, grade, social security account number (SSAN), primary AFSC, duty AFSC, training to AFSC, date entered training, and general AQE score. Enter the estimated training completion date, date for commander's evaluation, and maximum training dates, only when the individual trainee is entered into upgrade training or retraining. In order to determine the date for commander evaluation, and maximum training date, refer to table 2-2 for regular Air Force personnel and table 2-5 for ANG and AFRES personnel. NOTE: If a trainee receives an adjusted date of entry into upgrade training or retraining, change the estimated date of completion and appropriate training evaluation dates, if required.

b. Estimated Training Completion Date. The estimated training completion date is determined by the immediate supervisor. NOTE: Demonstration of proficiency, complexity of the specialty, and the number of CDC volumes must be considered when computing estimated completion dates. For example, an airman in UGT to the 5-level is given an estimated completion time of 6 months. He or she has an 8 volume CDC. In this case, the estimated completion time should have been 9 months. NOTE: ANG and AFRES supervisors use table 2-5, column C, for determining estimated completion dates for Air Reserve Forces Personnel.

10-9. Section II, Orientation and Certification. The trainee signs in the appropriate block when he or she is entered into upgrade training. When the immediate supervisor enters his or her name and grade in the appropriate block, this certifies that the action listed opposite the block has been performed. If the AF Form 623 is reaccomplished, the certifying official signs in the block titled, "Signature and Title of Certifying Official."

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10-10. Section IV, ECI/CDC Participation. Enter all CDCs and ECI, USAFI, and other correspondence courses satisfactorily completed. In column "A" enter the course number and title. In column "B" indicate the total number of volumes in the course. In column "C" indicate the date on which the course was satisfactorily completed.

10-11. Section V, Technical and Supervisory Training. List all technical and supervisory courses satisfactorily completed. Typical entries are limited to formal technical schools, but include FTD courses, training management classes, NCO leadership school, etc.

10-12. Entry Corrections. Anytime that an ink entry is changed, place correction tape over the entry. Then enter the correct information on the correction tape. Dull finish transparency tape may be placed over blocks subject to change to make erasure easier and to protect the form.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

LEW ALLEN, JR., General, USAF
Chief of Staff

VAN L. CRAWFORD, JR., Colonel, USAF
Director of Administration

SUMMARY OF CHANGES

Updates types of OJT advisory services (chapter 3); adds duties and responsibilities to the CBPO and unit OJT managers (chapter 4); changes duty titles from administrator to manager (chapter 4); adds chapter on quality training (chapter 5); adds information concerning typing test and recording qualification training (chapter 6); expands guidance on using STS SRs (chapter 7); deletes references to the 1974 edition of AF Form 623; exempts primary aircrew personnel from maintaining an AF Form 623 (chapter 10); expands checklist for determining effectiveness of OJT program (attachment 2); adds sample staff assistance visit report (attachment 4); updates training status codes (attachment 5); adds general purpose OJT checklist (attachment 6); and adds glossary of terms (attachment 7).

C1

EXPLANATION OF TERMS

1. **Air Force Specialty (AFS).** A grouping of positions which require common qualifications. An AFS is identified by a title and a code.

2. **Air Force Specialty Code (AFSC).** A combination of meaningful digits used to identify an AFS.

3. **Air Force Specialty Description.** A description of an AFS which includes the title, code, summary, duties, qualifications, and other specialty data and shredouts, as appropriate.

4. **Air Force Specialty Prefix.** An identification, by means of a title and alphabetical designator, of an ability, skill, special qualifications, or system not restricted to a single AFS.

5. **Air Force Specialty Shredout.** An identification of part of an AFS by means of a title and alphabetical suffix to the appropriate AFSC to designate specific equipment or function embraced in an AFS.

6. **Air Reserve Forces (ARF).** The personnel assigned to units of the Air National Guard (ANG) and Air Force Reserve (AFRES) and individuals assigned as mobilization augmentees (MA) to Regular Air Force units.

7. **Career Knowledge Training.** That part of career development intended to result in the acquisition of the general knowledge of basic principles and theories related to a career area.

8. **Code Key.** An alphanumeric symbol used to describe the minimal skill or knowledge requirements of an AFS. A proficiency code key is included in attachment 1 of each STS.

9. **Concept.** (1) A generalized idea of something. (2) An abstract thought or phenomenon grasped by the mind.

10. **Contingency Tasks.** Those tasks required to support mission requirements during emergency operations. These tasks are usually not performed during peacetime.

11. **Control Air Force Specialty Code (CAFSC).** A code established to make airman assignments and help identify and control training requirements. Use the CAFSC as a management tool to control both individual airman assignments and the equitable distribution of airmen by grade and skill against manning requirements.

12. **Course Examination.** A written test used as the final examination for a CDC.

13. **Course Training Standard.** An ATC course control document that describes the training to be conducted in a course of instruction in terms of tasks, knowledge, and proficiency.

14. **Apprentice Knowledge Test (AKT).** A comprehensive multiple choice wirtten test designed to measure technical knowledge at the semiskilled 3 level.

15. **Bypassed Specialist.** A person who has been awarded the semiskilled level of an AFS based on prior civilian or military occupational experience or schooling.

16. **Career Area.** A group of utilization fields that are broadly related on the basis of required skills and knowledge.

17. **Career Development.** The process of skill and knowledge upgrading that occurs as a result of job experience, OJT, attendance at formal courses, and completion of ECI and career development courses, etc.

18. **Career Development Course.** A correspondence type course designed to satisfy requirements for knowledge applicable to the AFS.

19. **Career Field.** A group of related airman AFSs that involve basically similar knowledge and skills. It includes career field subdivisions and ladders.

20. **Career Field Ladder.** A division of a career field in which closely related AFSs are arranged in one or more ladders to indicate lateral functional relationship merging at the advanced 7 or superintendent 9 skill level.

21. **Directed Duty Assignee (DDA).** Basic Military training (BMT) graduates or technical training eliminees assigned to units for on-the-job training.

22. **Duty.** A large segment of the work done by an individual. The italicized paragraph headings in the duties and responsibilities section of the specialty descriptions in AFR 39-1 set forth the major duties performed in each AFSC.

23. **Duty Air Force Specialty Code (DAFSC).** The authorized manning document AFSC that identifies the position to which an individual has been officially assigned.

24. **Excessive Training (tables 2-2 and 2-5, column D, Maximum Training Date).** The time limit established by this column is considered the maximum amount of time a trainee should need for upgrade training. To be continued beyond this time requires classification board review and the approval of the major command or separate operating agency. Once the individual reaches column D, he or she is in excessive training.

25. **Extension Course Institute (ECI).** The organization

responsible for publication and administration of most CDCs.

26. First-Term Airmen. For active duty airmen, this means the initial enlistment; for ANG/AFRES, it applies to an individual who has not completed his or her military service obligation.

27. Job Knowledge Training. Specific knowledge applicable to an airman's position assignment.

28. Job Proficiency Guide (JPG). An STS, annotated to show tasks, knowledges, and study references, applicable to a position of an AFS, and to show those tasks assigned and certified complete. The JPG may include AF Forms 797 and 1098.

29. Job Proficiency Training. Training on performance of those items indicated as assigned on a JPG. Training toward qualification for a position of an AFS. Satisfies "demonstration of proficiency" requirement for upgrading.

ch1 **30. Lateral** OJS **Training.** Training in an AFS for which the designated input is from another AFS.

31. Mobilization Augmentee (MA). A ready Reserve member assigned to a Regular Air Force unit against an individual manpower augmentee authorization, established to support the period immediately following a declaration of war or national emergency or to respond to any situation that national security requires.

32. On-the-Job Training (OJT). A planned training program designed to qualify airmen, through self-study and supervised instruction, to perform in a given AFS while actually working in a duty assignment of their AFS.

33. Overtime Training (see tables 2-2 and 2-5, column C, Commander's Evaluation Date). Trainees who have not been upgraded (completed UGT) prior to the time limits indicated in this column are considered to be in overtime training. Normally, trainees are qualified for upgrading prior to this point in time.

34. PDS Code. A three-character alphanumeric code used in the Personnel Data System to record attendance at training courses. The PDS code, an integral part of course identification information, must be included in special orders, certificates of completion, and other places in which course identification is required. The complete list of PDS codes is contained in AFM 300-4, volume II. AFM 50-5, USAF Formal Schools Catalog, specifies the PDS code for each course listed.

35. Performance. (a) Application of principles and skills learned, to the solution of a problem or actual accomplishment of a job. (b) A practice or tryout experience in which a student is developing skills and applying principles by using specific skills to complete tasks under controlled conditions. (c) Actual accomplishment, as distinguished from potential ability, capacity, or aptitude.

36. Performance Method. A method of instruction which provides the student with the opportunity to develop and apply, under controlled conditions and close supervision, the skills or principles which have been explained and demonstrated.

37. Performance Test. A measurement of a student's ability to perform operations and processes involved in a job.

38. Position. The duties and tasks established as the work requirement for one individual. A position exists whether occupied or vacant.

39. Primary Air Force Specialty Code (PAFSC). The awarded specialty in which the individual possesses the highest skill level. If the individual possesses more than one AFSC at the highest level, the AFSC in which he or she is most qualified to perform duty is designated as primary.

40. Program Technical Training (PTT). The mission directive for accomplishing military and technical training.

41. Qualification Training. A program of OJT designed to develop more knowledge and skill within an airman's assigned position, during the time he or she is not on UGT, and does not result in the award of an AFSC.

42. Review Training. Training provided to repeat phases or areas of study not satisfactorily completed during a previous training activity or process.

43. Retraining. A training program designed to qualify an airman for award of an AFS or AFS shredout not in the normal progression pattern of a currently awarded AFS.

44. Secondary Air Force Specialty Code (2AFSC). The awarded specialty representing the individual's second best qualification. EXCEPTION: In those instances where an airman possesses an imbalanced specialty that is not identified as a primary, it is reflected as a secondary.

45. Skill Level. The level of qualification in an AFS depicted by the fourth digit in the AFSC as follows:

1 - Helper Level
3 - Semiskilled Level (Apprentice)
5 - Skilled Level (Journeyman)
7 - Advanced Level (Supervisor/Technician)
9 - Superintendent Level

46. Specialty Training Standard (STS). A Department of Air Force publication which describes an Air Force specialty in terms of tasks and knowledge that an airman in that specialty is required to perform or to know on the job. It indicates the level of skill or knowledge that the trainee must have at each skill level. It indicates the extent to which ATC airmen courses provide training on each of the listed knowledges and tasks.

47. Study References (SRs). Documents, relative to specific AFSs, recommended for study to satisfy the knowledge requirements for upgrading. STSs provide related SRs.

48. Study Reference Guide (SRG). A document given to CDC trainees that lists documents, related to specific AFSs, recommended for study.

49. Supervisor. The trainee's reporting official. The terms "supervisor," "immediate supervisor," and "reporting official," as used in this regulation, are synonymous.

50. Task. A unit of work activity which forms a significant part of a duty. Task statements may be found under duties listed in AFR 39-1, and on STSs and JPGs.

51. Task Breakdown. A detailed procedural instruction for performing a specific task, providing important steps, and key points.

52. Technical Reference. A publication listed in the STS or JPG which provides the required task knowledge.

53. Training Capability. The ability of a unit to provide OJT. Availability of equipment, qualified trainers, study references, etc., are all factors that must be considered when determining a unit's capability. Training capability is always determined as pertinent to a particular AFS.

54. Training Priority Category. A phrase used to describe an AFS in terms of the complexity of its knowledge requirements. It also specifies the method through which training to the 3-skill level is accomplished. There are 3 training categories used by the PTT to describe each AFS - A, B, and C. These symbols are explained as follows:

a. Training Priority Category A. Most of the airmen assigned in this category receive their 3-skill level AFSC as a result of satisfactory completion of a formal basic course.

b. Training Priority Category B. Some of the airmen assigned in this category receive their 3-skill level as a result of satisfactory completion of a formal basic course. Most of the remainder of the airmen receive their 3-skill level through OJT.

c. Training Priority Category C. Most of the airmen assigned in this category receive their 3-skill level AFSC through OJT.

55. Training Standard. See Course Training Standard and Specialty Training Standard.

56. Training Status Code. An alpha character used to identify a training situation or condition (see attachment 5).

57. Training to AFSC. That AFSC to which an airman is entered for upgrade training or retraining.

58. Upgrade Training (UGT). Training administered for the purpose of upgrading skill level, as distinguished from training not intended to result in AFSC upgrade, such as qualification training.

59. Volume Review Exercise (VRE). An open book, multiple choice exercise that is designed to teach through active response, reinforcement, and feedback.

60. Written Test. A paper and pencil test in which the student answers a series of questions, such as multiple-choice, matching, and completion.

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CHECKLIST FOR DETERMINING EFFECTIVENESS OF OJT PROGRAMS

This checklist is a general guide for OJT supervisors in determining the effectiveness of OJT programs. Its applicability depends on the levels of command.

A. ORGANIZATIONAL LEVEL VISITS

1. Visit each organization level appropriate to your assignment (wing, group, squadron, section, work unit, or equivalent echelons of the organization).

2. Examine organizational charts, training charts, records, reports, OJT regulations, training materials, and test results.

3. Note the good points of the program as well as the weak points.

4. Question OJT managers, section heads, work unit supervisors, trainers, and trainees at all levels, relative to their responsibility for, and knowledge of, OJT.

5. Observe management of units, work performance, quality and quantity of production, any backlogs, and effectiveness of training on the job.

6. Evaluate the findings and make recommendations for improvements and for keeping up the good work.

7. Followup to determine whether recommended changes have been made. Did these changes have the effect you expected?

8. During each visit, find answers to the following questions.

B. SELF-ASKED QUESTIONS

1. Do sections, squadrons, and the CBPO unit have OJT supervisors?

2. Does each office have current copies of all applicable training directives?
   a. Are they being complied with?
   b. Do they clearly point out responsibilities and procedures?
   c. Do they indicate guidance as well as control?
   d. Do they provide for systematic followup?
   e. Is each existing training directive necessary?

3. What records are kept? Is each one necessary?

4. What reports are sent from work units to higher echelons? Are excessive reports required?

5. Are the records and reports accurate?
   a. Do they give a satisfactory indication of the training being done? Do they show the effectiveness of the training?
   b. Do they show shortages, overages, or improper utilization?

6. What training materials are being used?

7. Is the OJT program based on appropriate outlines?

8. Are locally prepared JPGs prepared by annotating the applicable STS?

9. Are personnel at all levels properly indoctrinated in the OJT program? Do they understand the responsibilities and requirements at each level of supervision?

10. Are immediate supervisors planning, developing, and implementing training programs based on day-to-day and contingency mission requirements?

11. Are enough people in the work centers trained on tasks required to support missions? Have all tasks been identified in Job Proficiency Guides (JPGs)? Do supervisors have a management tool which lists the tasks required of the work center, number of personnel required to be proficient on each task, and who can do each task? Is information from this JPG used to help schedule work and training? Is it used to identify individual training needs?

12. Are supervisors aware of training deficiencies, if any exist? Have they taken steps to correct deficiencies?

13. Have supervisors evaluated newly assigned personnel to determine task qualifications?

14. Have supervisors identified the need for qualification training due to changes in equipment or procedures?

15. Are trainees completing all knowledge and proficiency training requirements prior to being recommended for AFSC skill level upgrading?

16. Does the immediate supervisor initiate AF Form 1284, Training Quality Report, when recent graduates from formal schools listed in AFM 50-5 do not meet the proficiency levels specified for the courses in columns 2A or 4A of the applicable STS?

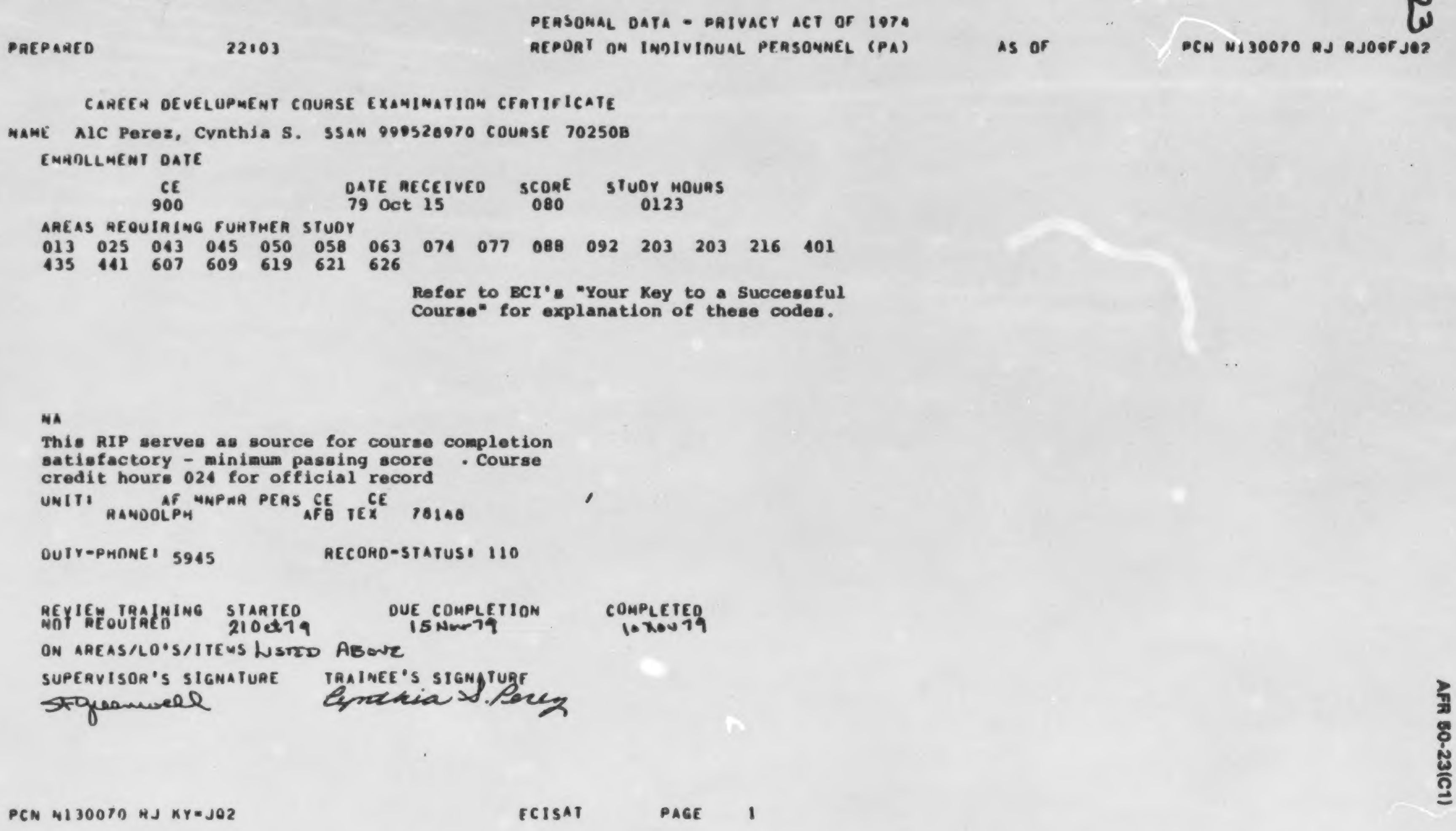
17. Do trainees know the tasks they are required to perform? Does this agree with those tasks identified in JPGs?

18. Can personnel perform the tasks for which they are certified on their JPGs?

19. Are no-notice performance evaluations performed by the unit OJT manager?

```
                                        PERSONAL DATA - PRIVACY ACT OF 1974
PREPARED                                REPORT ON INDIVIDUAL PERSONNEL (PA)       AS OF           PCN N130070 RJ RJ09FJ02

  REPORT OF CAREER DEVELOPMENT COURSE EXAMINATION
     (VOLUME REVIEW EXERCISE)
NAME  SMS TUCKER EDDIE        SSAN 999578970 COURSE 42651                   VOLUMES COMPLETED
   ENROLLMENT DATE   79 May 10                                         VOL NR      SCORE       DATE COMPLETED
              VRE                DATE RECEIVED    SCORE    STUDY HOURS    01          85          79 Jun 15
              02                  79 Jul 15       092         024
   ITEMS REQUIRING FURTHER STUDY
   005  019  024  053  061  078



   ITEMS NOT SCORED- DELETE FROM VRE
   003  023  074

NA


   UNIT:       AF MNPWR PERS CE    CE                          /
         RANDOLPH              AFB TEX    78148

   DUTY-PHONE: 5945          RECORD-STATUS: 110
  Review Training Started    Due Completion      Completed
  Not Required     23Jul79      15Aug79           10Aug79

  On Areas/LO's/Items LISTED ABOVE
   SUPERVISOR'S SIGNATURE    TRAINEE'S SIGNATURE
    SFGreenwell               Eddie Tucker
```

Figure A3-1. ECI Report of Volume Review Exercise (VRE).



```
                                          PERSONAL DATA - PRIVACY ACT OF 1974
PREPARED            22:03                 REPORT ON INDIVIDUAL PERSONNEL (PA)        AS OF          PCN N130070 RJ RJ09FJ02

      CAREER DEVELOPMENT COURSE EXAMINATION CERTIFICATE
NAME  A1C Perez, Cynthia S.  SSAN 999528970 COURSE  70250B
   ENROLLMENT DATE
              CE                  DATE RECEIVED   SCORE   STUDY HOURS
             900                  79 Oct 15        080        0123
   AREAS REQUIRING FURTHER STUDY
   013  025  043  045  050  058  063  074  077  088  092  203  203  216  401
   435  441  607  609  619  621  626
                              Refer to ECI's "Your Key to a Successful
                              Course" for explanation of these codes.


   NA
   This RIP serves as source for course completion
   satisfactory - minimum passing score   . Course
   credit hours 024 for official record
   UNIT:        AF MNPWR PERS CE   CE                        /
        RANDOLPH                 AFB TEX   78148

   DUTY-PHONE: 5945             RECORD-STATUS: 110


   REVIEW TRAINING  STARTED         DUE COMPLETION        COMPLETED
   NOT REQUIRED     21Oct79          15Nov79               10Nov79
   ON AREAS/LO'S/ITEMS LISTED ABOVE
   SUPERVISOR'S SIGNATURE     TRAINEE'S SIGNATURE
                              Cynthia S. Perez


PCN N130070 RJ KY=J02                       ECISAT        PAGE      1
```

Figure A3-1. (Continued)

SAMPLE OJT STAFF ASSISTANCE VISIT

DP (date)

On-The-Job Training (OJT) Staff Assistance Visit

(Wing/Group CC)
(Appropriate DCS, if applicable)
(Unit Commander)
IN TURN

1. The first paragraph of each report should provide the names of the visitors, inclusive dates of the visit, purpose of the visit, and the names and positions of personnel contacted.

2. Each report should contain a brief overview or resume of the visit that addresses, in a general nature, those areas listed in table 4-3, duty 31. Any ratings used should conform to the following standard adjectival ratings:

a. Outstanding (O). Far exceeds requirements as prescribed in mission directives. Management and supervisory procedures in effect resulted in exceptionally effective and efficient mission accomplishment. Virtually an error free operation. No repeat deficiencies noted.

b. Excellent (E). Performance of operation exceeds requirements as prescribed in mission directives. Activity is effectively and efficiently managing assigned resources. No significant repeat discrepancies noted.

c. Satisfactory (S). Meets requirements as prescribed in mission directives. Deficiencies may exist but do not detract from accomplishment of basic mission requirements. Relatively free from significant deficiencies.

d. Marginal (M). Does not meet all requirements as prescribed in mission directives. Wartime operation or support may be limited by existing deficiencies. Avoidable, significant deficiencies are common. Existing deficiencies, if not corrected, will further decrease effectiveness of mission accomplishment.

e. Unsatisfactory (U). Does not meet requirements as prescribed in mission directives. Wartime operation or support will be severely limited by existing deficiencies. Poor leadership and management; unsafe, unorganized, or undisciplined practices; and noncompliance with intent and guidance of directives are general.

3. Subsequent paragraphs will address specific conditions, both good and bad, which substantiate the statements and ratings made. Fully explain each condition and its impact on the training effectiveness of the unit. Also make specific recommendations on how to correct the deficiency and prevent its recurrence.

4. Attach forms reflecting the results of the practical evaluations conducted. If a formal reply is required, send it through command channels to the CBPO-OJT section. A copy should also be sent to the parent MAJCOM OJT manager.

LIST OF TRAINING STATUS CODES

Code A. Normal upgrade training to the 3-skill level.

Code B. Normal upgrade training to the 5-skill level.

Code C. Normal upgrade training to the 7-skill level.

Code D. WARSKIL Training.

Code E. Retraining to the 3-skill level. Includes reclassified airmen and airmen retraining for a new suffix at the 3-skill level in the same career field ladder.

Code F. Retraining or continued retraining to the 5-skill level and has possessed or does possess another awarded AFSC at the 5-skill level or higher. Includes retraining for a new suffix in the same career field ladder.

Code G. Retraining or continued retraining to the 7-skill level and has possessed or does possess another AFSC at the 7- or 9-skill level. Includes retraining for a new suffix in the same career field ladder.

***Code H.** Eligible and recommended for training but airmen cannot be trained because they are performing duty and controlled in Reporting/Special Duty Identifiers (except those reported in Training Status Codes "P" and "J").

Code I. Returned to duty in an awarded AFSC from another awarded AFSC. Special Duty Identifier, or Reporting Identifier; possesses the highest attainable skill level for present grade in AFSC to which returned; has not been assigned in that CAFSC within the past 6-month period; is in grade E-4, E-5, or E-6.

Code J. Basic military training listed in AFM 50-5.

Code K. Technical school training listed in AFM 50-5 that awards a 3-skill level AFSC.

Code L. Other technical school training. Includes all formal school training listed in AFM 50-5 that leads to award of an AFSC that is not identified in Code K. For example: Phase II medical training and other courses that lead to award of the 5- and 7-skill level.

Code M. Airmen who have been approved for retraining according to AFR 39-4, whose control AFSC has been changed to the retraining in AFSC according to AFR 35-1, and who are awaiting formal school class start date.

Code N. First-term airmen or career airmen who decline 7-level training according to AFR 50-23, table 2-1 (table 2-4 for ANG/AFRES) or who have approved discharge under AFR 39-10 or AFM 39-12 pending separation and are not recommended for further upgrade training according to AFR 50-23, table 2-3.

Code O. Not recommended for upgrade training according to AFR 50-23, table 2-3, rule 6, note 5 (see table 2-6, rule 5, for ANG/AFRES).

***Code P.** Eligible and recommended for training, but airman cannot be trained because of duty status (in confinement, AWOL, hospitalization, awaiting security clearance, officer trainee, TDY out of CAFSC, temporary/permanent PRP disqualification). This code also applies to airmen whose AFSC has been withdrawn and are awaiting involuntary separation or retraining (RIs 99005/99006).

Code Q. Eligible and recommended for training, but airman cannot be trained because of lack of training capability as described in AFR 50-23, paragraph 1-5b. (Use this code when the capability is not available due to temporary duty as well as PCS.)

Code R. AFSC awarded through completion of training.

Code S. Reserved.

Code T. Withdrawn from upgrade training or retraining because of failure to progress.

***Code U.** Withdrawn from formal training listed in AFM 50-5 for academic reasons. (Interim code used to indicate reason for not completing course. Remove from this code upon arrival at station.)

Code V. Withdrawn from formal training listed in AFM 50-5 for other than academic reasons. (Interim code used to indicate reason for not completing course. Remove from this code upon arrival at station.)

Code W. AFSC awarded by method other than training, for example, award of 9-skill level AFSC.

Code Y. Not applicable.

GENERAL PURPOSE CHECKLIST (see note)

CHECKLIST FOR EVALUATING QUALITY OF PROFICIENCY/QUALIFICATION TRAINING

1. Specialty Training Standards/Job Proficiency Guides (not required for personnel in grade E-7 thru E-9 unless in a retraining status or directed by MAJCOM):

a. Is a master JPG developed to outline all job and AFS training requirements, to include contingency tasks, in each section or work center with a master JPG requirement?

b. Do the identified tasks accurately depict the totality of all jobs performed?

c. Is AF Form 797, JPG Continuation Sheet, used to identify tasks not listed in the specialty training standards (STSs)?

d. Are individual JPGs developed from the master JPG?

2. Evaluation. Require individuals to perform a sampling of tasks certified as complete.

a. Are individuals proficient to perform tasks evaluated? If not, find out why the individuals were certified.

b. Is the overall quality of the training provided adequate for mission accomplishment?

c. How are alternate personnel identified and trained as backups for unique or one-deep positions?

d. Are the supervisor and trainer knowledgeable about training responsibilities and procedures?

e. Are the supervisor and trainer qualified to perform tasks they are conducting training on? (If they're required to maintain an AF Form 623, check their JPG for certification.) (See paragraph 1-5b(1) for exceptions to this rule.)

f. Do supervisors and trainers communicate with trainees concerning their training?

g. Use AF Form 689, Task Performance Checklist, AF Form 2419, Routing and Review of Quality Control Reports, or similar approved form to report and record task checks.

NOTE: This checklist for CBPO/UNIT OJT use. Optional for MAJCOM functional manager/IG use.

GLOSSARY

AFHRL - Air Force Human Resource Laboratory
AFPT - Air Force Proficiency Test
AFRES - Air Force Reserve
AFS - Air Force Specialty
AFSC - Air Force Specialty Code
AKT - Apprentice Knowledge Test
ANG - Air National Guard
APR - Airman Performance Report
ARF - Air Reserve Forces
BOF - Behavioral Objectives Format
CAI - Computer Assisted Instruction
CAR - Customer Account Representative
CBPO - Consoldated Base Personnel Office
CDC - Career Development Course
CDTS - Computer Directed Training System
CE - Course Examination
CR - Criterion Reference
CRE - Chapter Review Exercise
CRTO - Consolidated Reserve Training Office
DDA - Directed Duty Assignment
DOS - Date of Separation
ECI - Extension Course Institute
GSU - Geographically Separated Unit
IPR - Instrumentalist Performance Requirements
JET - Job Education Training
JPG - Job Proficiency Guide
LO - Learning Objective
LOE - Learning Objective Exercise
MA - Mobilization Augmentee
MAJCOM - Major Command
MMICS - Maintenance Management Information and Control System
NAF - Numbered Air Force
NCOIC - Noncommissioned Officer in Charge
OIC - Officer in Charge
OJT - On-the-Job Training
PCS - Permanent Change of Station
PDO - Publications Distribution Office
PDS - Personnel Data System
PRP - Personnel Reliability Program
PTT - Programmed Technical Training
SAV - Staff Assistance Visit
SDI - Special Duty Identifier
SKT - Specialty Knowledge Test
SOS - Squadron Officer School
SR - Study Reference
SRG - Study Reference Guide
STS - Specialty Training Standard
TQR - Training Qualification Record
TR - Technical Reference
TSM - Training System Manager
UGT - Upgrade Training
UMD - Unit Manning Document
VRE - Volume Review Exercise

* APPLYING ISD TO THE PROFICIENCY/QUALIFICATION CHANNEL OF OJT

INTRODUCTION:

Instructional System Development (ISD) is a structured process for planning and developing training programs. It consists of a five step process which ensures that personnel are taught the knowledges, skills, and attitudes essential for successful job performance. In the past ISD has been applied primarily during development of formal resident courses. The principles and process of ISD can also be applied to improve present OJT programs and to develop new programs. This attachment is intended to demonstrate how the principles of ISD should be applied to the proficiency and qualification channel of the dual channel OJT program. The OJT program must be flexible and some of the steps will be much less formal than in other applications of the process. The program must be conducted to meet behavioral needs and provide a means to evaluate the training provided.

STEP 1: Analyze System Requirements. The content of any OJT program should be based on total job performance to include the training and experience of the personnel expected to do the job. To determine job requirements each supervisor or trainer should collect all documents which specify duties and tasks for the AFSC(s) involved in the total job. These documents include, but are not limited to, AF mission directives for the function, the Airman Classification Regulation (AFR 39-1), the specialty training standards (STS), Operational Plans (OPLANS), contingency plans, and other command, wing, or section directives. A complete task performance listing can be prepared from these documents. Most tasks will be found on the STS and merely require the supervisors to circle those tasks applicable to the job. Tasks from other documents should be listed on AF Form 797, Job Proficiency Guide (JPG) Continuation Sheet. Include a reference to the document from which each task was extracted to enable the supervisor to review and update the JPG as necessary. This list of tasks should be discussed and reviewed with the workers who are doing the job to ensure full task coverage. Proper completion of this step of the process will provide the master job proficiency guide required by chapter 6.

STEP 2: Define Education or Training Requirements. Once the job requirements are identified the supervisor must determine how many of these tasks reqire training. Job requirements minus previous qualifications or training = training requirements. For OJT purposes the task proficiency required is the qualified level, that is, the trainee can perform the task without assistance and meet local demands for speed and accuracy. As identified in the STS most formal technical schools do not bring the trainee to this proficiency level.

STEP 3: Develop Objectives and Tests. The primary objective of on-the-job training is development of task proficiency which implies "Hands on" performance. Practical evaluations are the most reliable method to evaluate task performance. Task breakdowns for many tasks are already available in technical orders, equipment checklists, etc. Supervisors should develop task breakdowns for those critical tasks on the job proficiency guide for which none exist. (Sample shown in figure 9-2). Use of these checklists and task breakdowns will ensure objective evaluations.

STEP 4: Plan, Develop, and Validate Instruction. The primary instructional method used in proficiency or qualification training is demonstration and performance. The trainer uses the same task breakdown or checklists developed in Step 3 to provide training on the operation to be performed. He or she demonstrates the task, has the trainee perform, and corrects deficiencies. Many times it is difficult to plan the sequence in which tasks will be trained, however, task training should coincide with work requirements schedules as closely as possible. Tasks infrequently performed should be trained using mock-ups, simulators, etc.; however, such simulation must be as realistic as possible.

STEP 5: Conduct and Evaluate Training. This is a continuing process of providing training and evaluating the program. Quality Control task evaluations, equipment inspections, staff assistance visit reports, etc., are excellent sources of feedback concerning the quality of training provided. Supervisors should utilize these tools as well as his or her personal observations to continuously evaluate the training program.

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Draft Copy for Air Force Pamphlet

HANDBOOK FOR AIR FORCE INSTRUCTORS

(To replace AFM 50-62, 1 April 1974)

January 1982

Academic Instructor & Foreign Officer School

FOR

ACADEMIC INSTRUCTOR SCHOOL

USE ONLY

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Chapter 1

THE AIR FORCE INSTRUCTOR

This manual will give you the practical information you need to teach adult students. While it also applies to most adult education situations, the emphasis is on a military setting. The manual was written and tested at the Air Force's Academic Instructor School at Maxwell Air Force Base, Alabama.

As a new instructor, you will find the manual useful because it summarizes the best of what experts in education have written. If you have been to a library for material on teaching recently, you were probably bewildered by the array of topics and the number of specialized texts.

This manual concentrates on the "academic" classroom. While it is hard to distinguish clearly between technical and academic instruction, you might find the following comparison useful. Technical instruction normally includes a much higher proportion of the full range of theory and skills the graduate will need. When technical students are tested, the instructor can be sure of what they can do; the instructor has "proof" they have mastered the course material. In academic instruction, the scope of the course usually has a more general range of possible skills, objectives, and content. Unlike technical instruction, the course often has no "cap," and students are encouraged to go beyond the minimum stated objectives. Instead of having technical instruction's "proof" of learning, the academic classroom often has only samples of learning as evidence. Instructors often must be satisfied with a sampling process when designing individual class periods and when evaluating student achievement. The process of sampling is further discussed in this manual in Chapters 3 and 4 on planning lessons and Chapters 20 through 24 on Evaluation.

You should not expect to learn everything you need to know about teaching solely from a manual. Extensive as this manual may appear, it cannot provide you with the final stages of the process--teaching and being judged on your teaching skills. Even experienced instructors can profit from constructive feedback--from other teachers and students--on their lesson preparation and presentation.

CURRICULUM PLANNING

The official Air Force process for curriculum planning, called ISD or Instructional System Development, is a sound approach of the systems type which has been successful in a variety of civilian and military contexts. The five steps in the ISD process--

1. analyze system requirements
2. define education/training requirements
3. develop objectives and tests
4. plan, develop, and validate instruction
5. conduct and evaluate instruction

--are described in detail in AFM 50-2, Instructional System Development, and AFP 50-58, Handbook for Designers of Instructional Systems. This manual does not duplicate these publications but complements them by spelling out the instructor's tasks and responsibilities which are related to classroom work. When planning curriculum, AFM 50-2 and AFP 50-58 should be used.

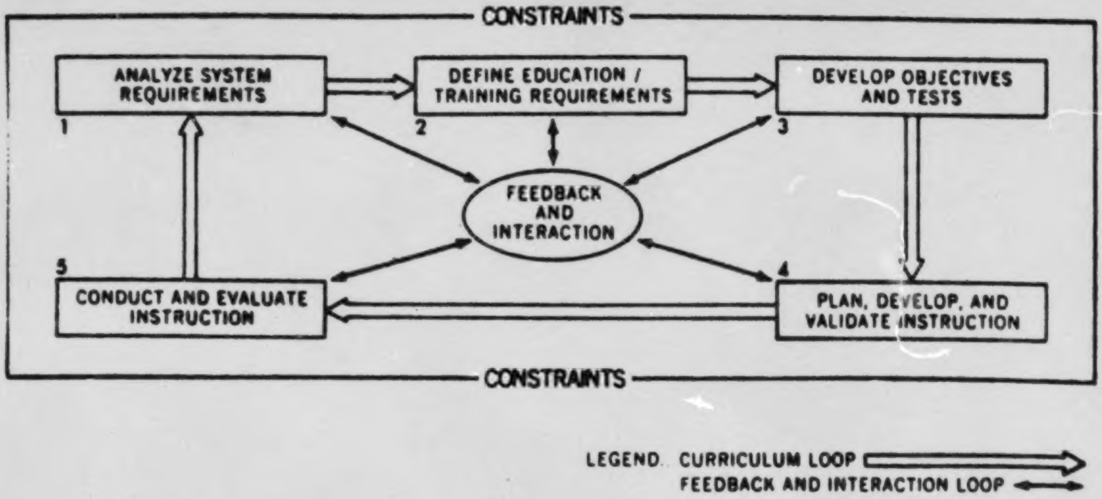

CONSTRAINTS
ANALYZE SYSTEM REQUIREMENTS
1
DEFINE EDUCATION / TRAINING REQUIREMENTS
2
DEVELOP OBJECTIVES AND TESTS
3
FEEDBACK AND INTERACTION
5
CONDUCT AND EVALUATE INSTRUCTION
4
PLAN, DEVELOP, AND VALIDATE INSTRUCTION
CONSTRAINTS
LEGEND: CURRICULUM LOOP
FEEDBACK AND INTERACTION LOOP

Figure 1-1 Model for Instructional System Development

The steps in the ISD process, particularly Steps 3-5, are used as an organizing theme in this manual. Once you understand the five steps in the ISD process, you should view your work as part of the total curriculum or "instructional system" for your school or course. When planning individual lessons, you should be aware of how the school determined the objectives and join in the process of validating them. When evaluation results are in, you should study this information for possible use in modifying the course. Not all instructors have the same degree of involvement in curriculum planning, and this manual does not attempt to qualify you as an ISD specialist. Courses for specialists in ISD offered by the Air Force's Air Training Command more fully explain the principles and techniques presented in AFM 50-2 and AFP 50-58.

EXTENSION COURSE VERSION OF AIS

This manual is used as a text for the correspondence version of the Academic Instructor School (AIS), available through the Air Force's Extension Course Institute. Several hundred persons complete this course each year. The correspondence course is especially useful for Air Force supervisors who want to be familiar with the resident course approach learned by their subordinates. Those who take the correspondence version of the AIS while instructing are encouraged to invite other instructors to observe their teaching. Units of the Air National Guard and Air Reserve often include teachers in civilian schools who can arrange to critique instruction. Student comments are valuable and should also be obtained, but students have a different perspective and their comments serve a different purpose. If it is possible to videotape lessons, the nonresident student has a powerful feedback device for self evaluation. Even an audiotape can be very useful for beginning instructors to learn more about their own classroom behavior.

INSTRUCTOR SKILLS USEFUL IN OTHER DUTIES

Military personnel often comment on the value of instructor training for more general duties as an NCO or an officer.

Air Force supervisors, like instructors, must give briefings, communicate in groups, counsel subordinates, and evaluate performance. Students or graduates of the resident course often comment on the value of areas such as counseling and human relations in assignments other than instructing. You may find material in this manual which will help develop such skills, but the material is included primarily because it is necessary for the successful instructor.

THE AIR FORCE APPROACH TO ACADEMIC INSTRUCTION

A major theme of this manual is the focus on the student, rather than the instructor or the subject matter. The focus on the student requires student centered objectives and conscious attention to how the student reacts to the instruction received. For efficient instruction, students need feedback which reinforces learning while identifying and correcting errors. Students need the opportunity to try out or work with what has been taught. Too often instruction is limited to the delivery of information, either through reading assignments, lectures, films, or slide-tape modules in a learning center. To tell is not necessarily to teach; to teach is not sufficient without effective learning.

In the approach presented in this manual, the only acceptable evidence that successful teaching has taken place comes from indications of change in student behavior. Important as good texts, good lectures, and good audiovisual materials are, they are only part of the process. At least as important is feedback to the student in the form of encouragement, comments on written papers, correction of mistakes, and similar teaching activities. Instructors must plan opportunities for observing student work so they can provide timely comments. In many technical courses, feedback is routine, but this step is often overlooked in academic classrooms. In addition to feedback from the instructor, a well designed course can include features such as self-tests and evaluation checklists which allow "self-correction" by the students.

Creativity in the Classroom

Creativity can be defined as the imaginative recombination of known elements into something new and useful. One of the charges often made against military instruction is that it is too traditional and lacks creativity. Dry as dust presentations that are more like briefings than real teaching lectures, wooden instructors who fail to communicate fully, and students forced to memorize and recite low level information--surely military classes like these are largely things of the past. But with all our modern insights and sophisticated aids to instruction, we still must not become complacent. There is a place in the military for creative teaching, but there are barriers to creativity which must be overcome.

A barrier is something that inhibits our ability to be free, natural, and spontaneous, thereby decreasing the opportunity for creative ideas. Recognizing and understanding various barriers is the first step in overcoming them.

Experts have identified four broad categories of barriers to creativity: inertia, fear, prejudice, and habit. Inertia causes many of us to continue to do what we are now doing unless we are challenged. Instructors who are afraid to be different may avoid attracting attention by leaving things as they are. Instructors who are prejudiced reject new approaches and methods, because they automatically pre-judge anything new without trying it. Habit is very much a problem to Air Force instructors. We may teach a course the same way time after time, not because the course is a good one, but because no one ever complained.

Air Force instructors, then, should be creative instructors, who know when to be guided by methods tested by time and when to strike boldly in new directions.

OVERVIEW OF MANUAL

This manual is designed to be read from chapter to chapter in order. Many of the chapters in this manual build on information presented earlier. You may find it difficult to understand a particular chapter if read out of sequence. A careful reading of the chapters in order should allow you to benefit most from what this manual has to offer.

The manual is divided into five major subject headings:

Section	Topic	Chapters
A	Lesson Planning	2 Learning Theory
		3 Writing Student-Centered Objectives and Tests
		4 The Level of Learning Lesson Planning Process
		5 Writing Criterion Objectives
		6 Developing the Teaching Plan

Section A introduces the theory and practice of writing student-centered objectives for academic instruction. The system of lesson planning combines both behavioral and cognitive learning theories. Because student behavior in the academic setting represents more than what simply meets the eye, it is important to plan for a change in the level of student understanding. The techniques presented here will prepare you to plan for lessons designed to develop skills, understanding, or attitudes.

Section	Topic	Chapters
B	Lesson Development	7 Developing Knowledge Level Lessons
		8 Developing Comprehension Level Lessons
		9 Developing Higher Level Cognitive Lessons
		10 Writing and Measuring Affective Objectives

Developing, organizing, and supporting academic lessons is the focus of Section B. We must plan carefully to achieve different levels of knowledge, understanding, and attitudes. Several approaches and patterns of lesson development promote student learning. Regardless of how well we write learning objectives, poor lesson development can hinder or even prevent desired learning outcomes.

Section	Topic	Chapters
C	Instructional Methods and Media	11 Using Questions for Learning 12 Survey of Teaching Methods 13 The Teaching Lecture Method 14 The Guided Discussion Method 15 The Case Study Method 16 The Teaching Interview Method 17 The Demonstration-Performance Method 18 Selection of Teaching Methods 19 Visual Aids and Instructional Media

While the academic instructor has a wide variety of methods available, Section C focuses on several of the most valuable:

Teaching Lecture
Guided Discussion
Case Study Method
Teaching Interview
Demonstration-Performance

The Selection of Teaching Methods chapter presents other methods in less detail. In addition, the questioning chapter focuses on the skills of classroom questioning which are fundamental to nearly all methods of instruction.

Section	Topic	Chapters
D	Evaluation	20 Introduction to Evaluation 21 Constructing and Administering Classroom Tests 22 Measuring Learning Outcomes 23 Evaluation by Rating 24 Criterion Referenced Evaluation 25 Norm-Referenced Analysis 26 Using Feedback in the Classroom

Section D introduces the two major approaches to evaluation: Norm Referenced (comparing individual student performance to that of the group) and Criterion Referenced (comparing individual student performance to a predetermined objective or standard). The section also introduces several ways to measure student performance and discusses the human element involved in providing meaningful feedback to students.

Section	Topic	Chapters
E	The Student as an Individual	27 Student Differences 28 The Dynamics of Small Learning Groups 29 The Instructor as a Counselor 30 Self Concept

The concluding section of the manual deals with the learner rather than the learning process. No instructional system can succeed unless the needs of the student are taken into account. We must address these needs whether we are planning for group or individualized learning. Instructors have a responsibility to establish a helping relationship with students.

CONCLUSION

This manual, then, is a fresh rethinking of a complex and not completely understood subject: How to teach in the academic classroom so that Air Force people will be more effective on the job. No book on this subject can have all the answers. But those who study this manual carefully will know the standard terminology and be able to ask and answer many of the right questions. With the help of this manual, instead of improvising in the classroom, we can now approach our teaching job more systematically.

SECTION A

LESSON PLANNING

Chapter	Title	Page
2	Learning Theory	2-1
3	Writing Student-Center Objectives and Tests	3-1
4	The Level of Learning Lesson Planning Process	4-1
5	Writing Criterion Objectives	5-1
6	Developing the Teaching Plan	6-1

Section A introduces the theory and practice of writing student-centered objectives for academic instruction. The system of lesson planning combines both behavioral and cognitive learning theories. Because student behavior in the academic setting represents more than what simply meets the eye, it is important to plan for a change in the level of student understanding. The techniques presented here will prepare you to plan lessons designed to develop skills, understanding, or attitudes.

Chapter 2

LEARNING THEORY

Learning means many things to many people. To some, learning is simply a change in behavior as a result of experience. To others, it is something more difficult to see and measure which involves changing thinking processes. We learn to name objects as children and solve complex problems as adults. We learn attitudes and values. We can even learn to learn by improving study skills. But how do we explain learning? Can any one theory of learning explain how we have learned all of what we can do, what we know, and why our attitudes and values are what they are? More important, what do we need to know about learning theory to be effective Air Force instructors?

A Historical View

Many theories try to explain how we learn, but psychologists and educators do not totally agree on any one of them. Most agree, however, that learning is best explained by one or some combination of two theories, behaviorism or cognitive theory.

Behaviorism. We know that all animals can learn. Many psychologists and educators believe that all animals, including humans, learn in about the same way. Behaviorists believe that we learn by having our behavior reinforced; that our behavior can be shaped or controlled by someone else. In the classroom, the "someone else" is the instructor. If what we do as students is positively reinforced, we will learn to do it better and more often. If we get no reinforcement or are punished for something we do, we will tend to stop doing it. And in general, it is better to get people to learn what we want them to learn by providing positive rewards than by punishing them.

The technical features of behaviorism are far more complex than this simple explanation. Those of us who need a high level understanding of behaviorism and its principles, especially authors of programmed instruction and other self-paced learning materials, should read the works of B. F. Skinner and Holland. As classroom instructors, though, we need to realize the importance of controlling learning experiences by manipulating the classroom environment (stimuli) which gives our students a chance to behave or perform (respond) in a way that we desire and can reward (reinforce). Behaviorism certainly explains the way our students learn much of what we teach. We need to be aware of the importance of stimulus, response, and reinforcement as they affect our classrooms. Whether we view ourselves as behaviorists or not, these are important concepts to consider as we plan, deliver, and evaluate instruction.

Cognitive Theory. Much of psychological thinking and experimentation today falls into the general category of cognitive psychology. Unlike the behaviorists, the cognitive psychologists are very concerned about what is going on inside the learner. Learning is not just a change in behavior. It is a change in the way a student thinks, or understands, or feels. Learning can be measured in terms of behavior, but the behavior only represents learning. Behavior is not equal to the learning in this theory.

Motivation, generalizing, insight, and discovery are significant concepts to cognitive theorists. Instructors have the responsibility to set up an environment which motivates students. Furthermore, we must plan learning experiences which allow students to go beyond simple recall and which cause students to gain an understanding of what they study.

Like the behaviorists, the cognitive psychologists acknowledge the importance of reinforcing behavior and measuring changes. Positive reinforcement is important when we are concerned with cognitive concepts such as knowledge and understanding. We still need to measure behavior, however, because it is the only way we can get a clue about what the student understands. While students may be able to do much more with what we teach than we are able to test, we have to measure what we can. And what we can measure is usually limited to the kinds of behavior we can capture on a paper and pencil test or a performance exam. There will be errors in measurement as we try to measure understanding, but since understanding cannot be measured directly we have little choice. Because we want to quantify learning, we have to measure and interpret student behavior.

Combining the Approaches

Both the behavioristic and cognitive approaches are useful learning theories. We can see from the two brief descriptions above that each theory has contributed to the way we plan, deliver, and evaluate Air Force instruction. Perhaps the best approach to planning and managing instruction is an approach which includes features of each major theory. The approach which retains the notion of cognitive learning while measuring behavioral outcomes seems to be most workable. We can plan for low or high order cognitive outcomes and determine if these outcomes have been achieved by measuring and interpreting behavior. We often say that students really understand something because they can do this or that. We can plan for cognitive learning, but we must use behavioral evidence of learning.

Several approaches for planning instruction exist which combine cognitive concepts and behavioral evidence of learning. This manual presents an approach for writing and measuring cognitive levels of learning which stresses the need to specify and measure behavior. To give us a better understanding of the range of possible cognitive learning outcomes, we will use the cognitive taxonomy of Dr. Benjamin Bloom as a frame of reference to plan instruction. By using this taxonomy or hierarchy of learning, we will carefully specify behaviors which will give us reasonable evidence of learning at the various levels of knowledge and understanding. Figure 2-1 contains the basic description of the cognitive domain according to Bloom. The approach to using this taxonomy will be explained in considerable detail in several chapters throughout this manual. Some Air Force instructors may already be familiar with other approaches for combining cognitive learning outcomes and behavioral evidence. The Air Force Proficiency Codes published in the Air Training Command Supplement to Air Force Regulation 8-13 as well as the hierarchy of learning presented in AFM 50-2, Instructional System Development, are two such approaches. These two approaches are quite comparable to the Bloom Taxonomy (see Figure 4-5).

A similar scheme for specifying attitudinal objectives has been developed by Krathwohl (Figure 2-2). Like the Bloom taxonomy, Krathwohl's hierarchy attempts to arrange attitudinal objectives in an order of difficulty. We can then attach behavioral evidence to the various levels of this taxonomy for purposes of measurement. Chapter 10 will provide ways in which this taxonomy may be useful for planning instructional objectives which deal with attitudes.

Levels of Knowledge and Understanding

Cognitive Domain

Level of Learning	Mental Activity
Evaluation	Exercise of learned judgment
↑	
Synthesis	Create new relationships
↑	
Analysis	Determine relationships
↑	
Application	Use of generalizations in specific instances
↑	
Comprehension	Translate, interpret, and extrapolate
↑	
Knowledge	Recall and recognition

Adapted from Bloom, B.S., ed., et al. *Taxonomy of Educational Objectives: Cognitive Domain*. New York: David McKay Company, Inc., 1956.

Figure 2-1

Levels of Attitudes and Values

Affective Domain

Level of Learning	State of Mind
Characterization	Incorporates value into Life Style
↑	
Organization	Rearrangement of value system
↑	
Valuing	Acceptance
↑	
Responding	Reacts voluntarily or complies
↑	
Receiving	Willingness to pay attention

Adapted from Krathwohl, D. R., et al. *Taxonomy of Educational Objectives: Affective Domain*. New York: David McKay Company, Inc., 1964.

Figure 2-2

There are several, minor taxonomies which deal with physical or psychomotor skills. None of these systems has been as popularly accepted as those of Bloom and Krathwohl. The Air Force Proficiency Codes are generally as acceptable as other coding systems to those who plan instruction leading to physical skills. This pamphlet will not deal with psychomotor skills to any significant degree.

Summary

We must measure student behavior, but we can plan for different levels of understanding and attitude development. The behaviorists have taught us the value of several basic learning concepts including stimulus, response, and reinforcement. We need to plan instruction which capitalizes on these sound concepts.

In addition, however, we must remember that behavior represents a sample of learning in many cases. It is possible to change viewpoints, increase understanding, or affect the way a student feels about something. These are changes in the student which cannot be observed and must be inferred from observed behavior. But most of us must determine learning outcomes to provide evidence that we are doing our jobs as instructors. We have no choice, then, but to measure behavioral indicators which we will accept as evidence of learning.

The system presented in this pamphlet combines several essential elements of behavioral and cognitive learning theory. It is not simple, but neither is learning. It is workable. Years of experience with this and other similar systems indicate that Air Force instructors can use it to plan, prepare, deliver, and evaluate effective and efficient instruction.

Chapter 3

WRITING STUDENT-CENTERED OBJECTIVES AND TESTS

Introduction

What can our students do at the end of our course that they couldn't when they started? How will we know? Over the years these have been difficult questions for many instructors to answer. Instructors teaching physical skills have generally done well answering these questions because much of what they teach is reasonably easy to describe and measure. But others of us who teach facts and develop understandings have had trouble coming up with clear answers.

One of the biggest problems is our traditional approach to planning for instruction, particularly as we write objectives. Often we have described our objectives by telling what goes on during instruction rather than the outcomes of instruction. We all have seen course objectives like "the instructor will explain" or "this course will cover." But something vitally important is missing. There is no mention of what students will be able to do as the result of the instruction. Taken to the extreme, as long as the instructor explained or the course was covered, instruction was successful—whether or not students learned anything. The most important measures of the success of our instruction must be the results we get, not the measure of how hard we worked to get them.

Teacher-centered vs. Student-centered Planning

Since the 1950s, there has been a movement within military and civilian education toward planning for student-centered instruction. Student-centered objectives, which describe learning in terms of outcomes rather than instructor activity, are now common to a generation of Air Force personnel. Within the USAF, the most important documents supporting this general trend have been AFM 50-2, Instructional System Development, and AFP 50-58, Handbook for Designers of Instructional Systems. Previous editions of AFM 50-62, Principles and Techniques of Instruction, have contributed to the concept of student-centered planning by providing useful techniques to the nontechnical instructor. In addition, many civilian texts are used both within and outside the USAF, as instructors and curriculum planners try to implement the goal of making instruction student centered.

As we begin to account more carefully for both money and instructional time, the trend toward student-centered instruction is sure to continue. Inspectors, auditors, and students and instructors themselves are no longer satisfied with traditional approaches to planning for instruction. Dissatisfaction with teacher-centered planning has given rise to new ways to specify and measure our objectives. Student-centered planning is now a fact of life in the Air Force.

Much of what is new in this manual is prompted by the desire for instruction to become more student centered. Several chapters are devoted to techniques for writing student-centered objectives. Throughout the chapters on teaching methodology, this same concern for student-centeredness will be apparent. Perhaps the most significant changes in the manual are found in the evaluation area. In these chapters, we develop the idea that, rather than be judged in comparison to one another, student performance should be measured against objectives. For many of us who have grown up with teacher-centered objectives, the ideas presented in these chapters will present new challenges. From the point of view of Air Force policy as well as modern educational practice, however, we must meet and master these challenges to improve student-centered instruction.

Planning for Student-Centered Outcomes

If our students have learned what we intended, they will perform differently after they finish our course than before. They will usually demonstrate this performance on some sort of test, whether with pencil and paper or by a physical task. Figure 3-1 represents the thought process of arriving at very specific testable behaviors and test items from more general student-centered objectives. This process, consistent with AFM 50-2 and AFP 50-58, is the central theme around which this manual has been developed. As we will see later in this manual, we usually plan for instructional objectives and tests by going from general objectives to very precise test questions. This planning process may take any number of steps to accomplish this general-to-specific planning approach, but the four steps identified in Figure 3-1 include all the steps necessary to accomplish good planning. It is a condensed but accurate version of the essential activities in Step 3 of the ISD process.

After we have been given the general mission for our school and know who our students are to be, we begin to plan for instruction. With the Air Force ISD model, this activity generally occurs with Step 3, Develop Objectives and Tests. However, since there is constant interaction between all five steps of the ISD model, planning for learning is dynamic and not actually limited to Step 3.

Four Step Process for Writing Student-Centered Objectives and Tests

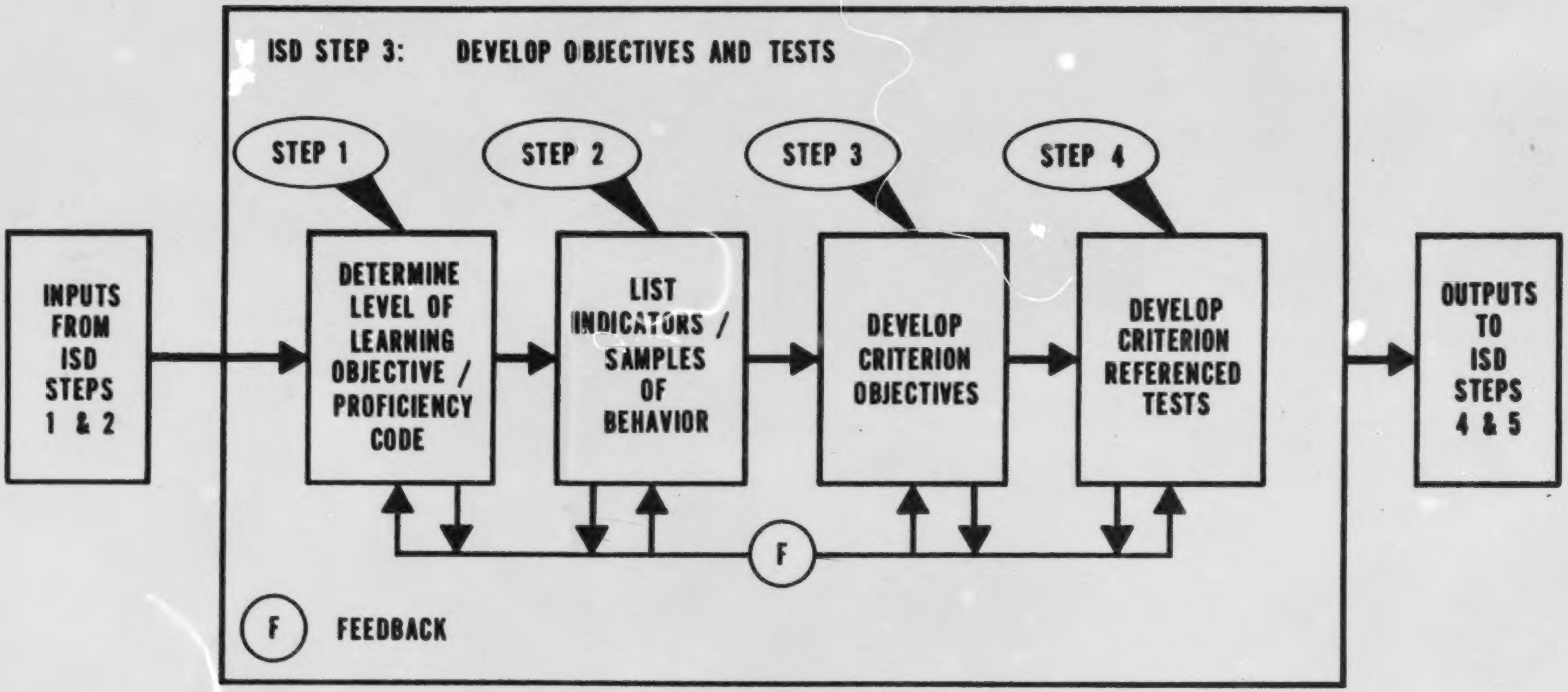
While there may be many successful ways to approach student-centered instructional planning, Figure 3-1 and the explanation below should provide an overview of the process to put each of the steps in perspective. Additional, detailed instruction on each step of the process will be provided throughout the remainder of this manual.

1. Determine level of learning objective/proficiency code

It is usually helpful to plan for learning with a general to specific strategy, that is, by starting with general objectives and ending with very precise test items. By writing general but carefully developed non-behavioral objectives as a first step in planning, we are better able later to verify precise behavioral outcomes. Behavior is easy to misinterpret if we do not have a classification scheme to analyze the behavior and categorize it. Schemes have been developed in many civilian texts and have been suggested in AFM 50-2, AFP 50-58, and earlier editions of this manual.

With these schemes, generally called taxonomies of educational objectives, levels of learning, or proficiency codes, we have a built-in common denominator which defines student behavior at each plateau of the learning hierarchy.

FIGURE 3-1, FOUR STEP PROCESS FOR WRITING STUDENT - CENTERED OBJECTIVES AND TESTS


ISD STEP 3: DEVELOP OBJECTIVES AND TESTS
STEP 1
STEP 2
STEP 3
STEP 4
INPUTS FROM ISD STEPS 1 & 2
DETERMINE LEVEL OF LEARNING OBJECTIVE / PROFICIENCY CODE
LIST INDICATORS / SAMPLES OF BEHAVIOR
DEVELOP CRITERION OBJECTIVES
DEVELOP CRITERION REFERENCED TESTS
OUTPUTS TO ISD STEPS 4 & 5
F
F FEEDBACK

Verbs which describe behavior alone cannot tell us the level of proficiency with which they may be associated. By assigning certain characteristics to levels of learning, we can be sure that student behaviors represent what we intend them to. It is easy to observe student behavior, but we must plan carefully before we assign meaning to that behavior. It is very important to decide the level of learning before we attempt to describe its evidence with behavioral precision. It is very important for us to make it clear in our objectives whether a student is to be able to recall an exact definition, for example, or to be able to define something in his or her own words. In each case, the behavior is to define, but recall is a simpler task than understanding as required in the ability to translate something in your own words. We may even come up with a definition as a result of problem solving--yet a higher level of learning. When we state the general level of learning as the first step in the writing process for objectives and tests, it makes each of the following steps better and more exact.

An illustration of a general level of learning objective which might require a student to recall a definition is provided below:

Example:

- Level of Learning Objective: the objective of this lesson is for each student to know the meaning of leadership

There are several schemes for classifying learning outcomes in use in the Air Force. Figures 3-2 through 3-4 present these schemes and identify their sources. Each scheme is workable and provides a basis for making the initial decision about how well something is to be learned. As can be seen, all of the schemes are comparable in that they attempt to describe the same thing, the level of a learning outcome. Any of the schemes can be and have been used successfully as the first step in the typical lesson planning process described in Figure 3-1, but the Bloom taxonomy has proven quite successful in academic situations and will be used throughout this manual. Instructors who are required to use the other taxonomies or proficiency codes should be able to adapt their requirements to the material in this manual by referring to Figure 3-5. Substitute the appropriate taxonomy level or proficiency code for the Bloom categories as indicated in Figure 3-5 (knowledge, comprehension, etc.) and proceed with the rest of the process as described throughout this manual. See Chapters 7-9 for further detail on writing instructional objectives to various levels of learning.

2. List indicators/samples of behavior

Once we have carefully communicated our general level of learning or proficiency, we must decide what student behaviors we will accept as evidence of learning. In physical tasks the decision is quite simple. There may be a one-to-one correlation. The change in behavior itself is often the objective and no interpretation is required.

In cognitive or affective learning, however, the relationship between student behavior and the level of learning is not always that simple. We must decide what behaviors are associated

Figure 3-2. COGNITIVE TAXONOMY[1]

LEVEL OF LEARNING	DEFINITION
Knowledge	Recall previously learned material (facts, theories, etc.) in essentially the same form as taught.
Comprehension	See relationships, concepts, and abstractions beyond the simple remembering of material. Typically involves translating, interpreting, and estimating future trends.
Application	Use learned material in new and concrete situations, including the application of rules, methods, concepts, principles, laws, and theories.
Analysis	Break down material into its component parts so that the organizational structure may be understood, including the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved.
Synthesis	Put parts together to form new patterns or structures, such as a unique communication (a theme or speech), a plan of operations (a research proposal), or a set of abstract relations (schemes for classifying information).
Evaluation	Judge the value of material for a given purpose. Learning in this area is the highest in the cognitive hierarchy because it involves elements of all the other categories, plus conscious value judgments based on clearly defined criteria.

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[1] Adapted from "Taxonomy of Educational Objectives Handbook I: Cognitive Domain," ed. B. S. Bloom, et al, New York: David McKay, 1956.

Figure 3-3. TYPES OF LEARNING[1]

TYPE	RELATED PERFORMANCES
Forming Associations	Involves associating, name, or responding to a specific input (stimulus). The person associates the response with a specific input only. The response may be vocal, subvocal (say-it-to yourself), written, or motor.
Forming Chains	Involves recalling sequences of actions or procedures which must be recalled in a specific order. In a chain the response to one input becomes the input to the next response. May involve chains of verbal responses or chains of motor responses.
Making Discriminations	Involves making different responses to the various members of a particular class; being able to distinguish among input information sources and/or types and then to respond appropriately to each.
Making Classifications	Involves responding in a single way to all members of a particular class of observable or abstract events. This involves recognizing the essential similarity among a class of objects, people, events or abstractions, and recognizing the differences which separate those objects, people, events, or abstractions which are not members of the class.
Using Rules	Involves applying rules to a given situation or condition by responding to a class of inputs with a class of actions. A rule states the particular relationship between two or more simpler concepts. It is helpful to think of rules as "if-then" statements.
Problem Solving	Involves comparing previously learned rules to create a higher order rule.

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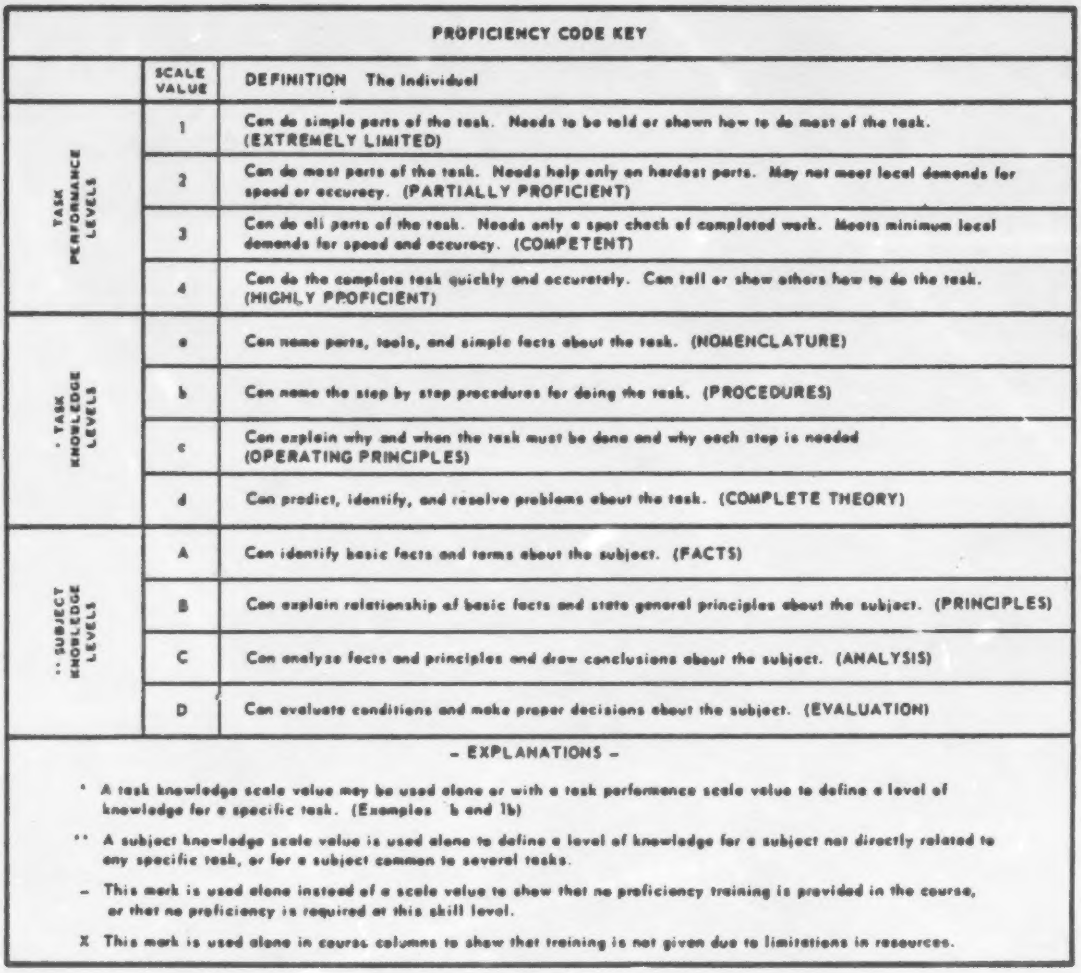
[1] Taken from Table 5-1, Types of Learning in AFM 50-2, Instructional System Development, 25 May 1979.

Figure 3-4. AIR FORCE PROFICIENCY CODES



PROFICIENCY CODE KEY		
	SCALE VALUE	DEFINITION The Individual
TASK PERFORMANCE LEVELS	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. May not meet local demands for speed or accuracy. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. Meets minimum local demands for speed and accuracy. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. (HIGHLY PROFICIENT)
* TASK KNOWLEDGE LEVELS	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can name the step by step procedures for doing the task. (PROCEDURES)
	c	Can explain why and when the task must be done and why each step is needed (OPERATING PRINCIPLES)
	d	Can predict, identify, and resolve problems about the task. (COMPLETE THEORY)
** SUBJECT KNOWLEDGE LEVELS	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can explain relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATION)

– EXPLANATIONS –

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Examples b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task, or for a subject common to several tasks.

– This mark is used alone instead of a scale value to show that no proficiency training is provided in the course, or that no proficiency is required at this skill level.

X This mark is used alone in course columns to show that training is not given due to limitations in resources.

(Proficiency Code Key - Qualitative Requirements, ATC Supplement/AFR 8-13)

Figure 3-5. COMPARISON OF TAXONOMIES OF LEARNING OUTCOMES

			ATC SUPPLEMENT/AFR 8-13	
TYPES OF LEARNING	COGNITIVE TAXONOMY AFM 50-62 This Edition (See Figure 3-2)	TYPES OF LEARNING AFM 50-2 AFP 50-58 (See Figure 3-3)	AIR FORCE PROFICIENCY CODE SUBJECT KNOWLEDGE (See Figure 3-4)	AIR FORCE PROFICIENCY CODE TASK KNOWLEDGE (See Figure 3-4)
REMEMBERING	KNOWLEDGE	FORMING ASSOCIATIONS FORMING CHAINS MAKING DISCRIMINATIONS	FACTS	NOMENCLATURE PROCEDURES
REASONING	COMPREHENSION	MAKING CLASSIFICATIONS	PRINCIPLES	OPERATING PRINCIPLES
PROBLEM SOLVING	APPLICATION ANALYSIS SYNTHESIS EVALUATION	USING RULES PROBLEM SOLVING	ANALYSIS EVALUATION	COMPLETE THEORY

with or indicative of a person who has a particular understanding or attitude. We know we cannot directly measure understanding or attitude, so we must decide which behaviors give us the best evidence of learning. Because we need to interpret behavior, there may be error. However, the value of the approach to measure learning by its outcomes far outweighs the risk of error.

We may accept many student behaviors as evidence of learning or just a few. The following example builds on the earlier illustration in paragraph 1 above:

Example:

- Level of Learning Objective: the objective of this lesson is for each student to know the meaning of leadership
- Sample of Behavior: define leadership

If we are very concerned about learning outcomes, especially if they are very complex, we may wish to specify several behaviors and eventually measure them all or at least a very large sample of them. For simple objectives such as the one illustrated above, we may be satisfied with just one or two samples of learned behavior. We have a very real and practical limitation, however. We can never fully and completely measure some understandings or attitudes. However, carefully analyzed and thought out, samples of behavior provide us with the best evidence of learning available to us. Chapters 4 and 10 discuss in more detail the concept of sampling cognitive and affective objectives.

3. Develop criterion objectives

Samples of behavior which indicate achievement of a learning outcome are usually simple performance statements, e.g., define leadership, write a staff summary sheet, explain the authoritarian style of management. Further detail concerning conditions under which a student must perform and levels of performance that are required are generally added in the next, separate step whether actually written down or simply assumed. Once conditions and criteria for behavior have been added to the sample of behavior, it is known as a criterion objective.

To continue with our earlier example regarding leadership, the thought process has now progressed to this point:

Example:

- Level of Learning Objective: the objective of this lesson is for each student to know the meaning of leadership
- Sample of Behavior: define leadership
- Criterion Objective: Given three alternative definitions of leadership and without the use of references, select the correct definition of leadership according to AFROTC.

Criterion objectives are valuable lesson planning tools. They are generally shared with students. In schools which provide students with samples of behavior only, the criterion objectives are still valuable to the instructor for planning instruction and developing test items. Whether written down or not, criterion objectives play an important role in designing student-centered instruction because they provide the specifications against which test items must be written.

4. Develop criterion referenced tests

The lesson planning process described in Figure 3-1 concludes with the construction of test items to measure learning. Other chapters discuss this concept in detail. Essentially, however, we must be able to construct test items from criterion objectives which give us the evidence that students have learned what we have intended. These test items are written prior to instruction and measure what should be learned rather than what happened to be taught. As Figure 3-1 illustrates, there is feedback between the four steps in this process, and each step is controlled by and accountable to all of the other steps. This practice of measuring the achievement of stated objectives, known as criterion referenced testing, is often more rigorous than traditional practices. Because of this additional difficulty, criterion referenced measurement has been slow in coming to some applications in the Air Force, although student-centered objectives are widely in use.

The example that we have been building to illustrate this planning process now concludes with the fourth and final step:

Example:

- Level of Learning Objective: the objective of this lesson is for each student to know the meaning of leadership
- Sample of Behavior: define leadership
- Criterion Objective: Given three alternative definitions of leadership and without the use of references, select the correct definition of leadership according to AFROTC.
- Test Item: AFROTC defines leadership as
  1. the willingness of a person to exercise management control over subordinates.
  2. the process through which the leader inspires effective individual effort in a group effort to achieve an objective.
  3. planning, organizing, staffing, directing, and controlling the capital, material, and human resources of an organization.

This example is obviously simple, but it does illustrate the four-step thought process for writing student-centered objectives and test items. Many instructional objectives are much more difficult to teach, learn, and define. In some instances, there may be several samples of learned behavior rather than one as illustrated here. Criterion objectives, whether actually written or assumed, can be much more elaborate and require several paragraphs of descriptive material. In addition, there are many more alternative and complex ways to test learning outcomes than the simple test item above. Regardless of how much more complex the subject matter or more difficult the level of learning, this four-step process for developing student-centered objectives and test items works. The results of this demanding thought process will be consistent with sound educational practice and will satisfy the critical elements of Step 3 of the Air Force ISD model.

Conclusion

We are in the midst of a difficult transition from teacher-centered to student-centered instruction. In spite of our teacher-centered tradition, we have come a long way toward specifying and measuring student-centered learning outcomes. For the past 20 years, Air Force Instructors and other progressive educators have worked to develop appropriate techniques to implement fully the concept of student-centered instruction.

While many techniques need further development, a helpful program for student-centered instructional planning consists of the following steps:

1. Determine level of learning objective/proficiency code

2. List indicators/samples of behavior

3. Develop criterion objectives

4. Develop criterion referenced tests

The lesson planning, methodology, and evaluation chapters of this manual incorporate the above procedures. While there are many approaches to the same end, this four-step strategy has worked in extensive field testing. The process of going from general level of learning objectives or other descriptions of learning outcomes which have been proficiency coded to precise criterion referenced test items will be explained more fully in the remaining chapters of this manual. This chapter has provided an overview of the system for writing student-centered objectives and tests. This system is the basis for much of the remaining material in this manual.

Chapter 4

THE LEVEL OF LEARNING LESSON PLANNING PROCESS

In Chapter 3 we were introduced to a four-step process for developing objectives and tests (Figure 4-1). In our examination of this process, we were briefly introduced to the concepts of educational taxonomies, level of learning objectives, samples of behavior, criterion objectives, and criterion referenced test items. This chapter will examine in more detail the first two steps of the four-step process, level of learning objectives and samples of behavior. Steps 3 and 4 will be developed in subsequent chapters. We will use the Bloom cognitive taxonomy as our base. Chapter 10 will cover this process for the affective taxonomy.

Bloom's Cognitive Taxonomy

Before we can begin writing level of learning objectives, we need an understanding of the types of learning outcomes represented by each level of the taxonomy. As you should recall, the Bloom taxonomy is structured as follows:

evaluation
↑
synthesis
↑
graduated levels of understanding } analysis
↑
application
↑
comprehension
↑
knowledge

This taxonomy is simply a means of rank ordering learning within the cognitive domain. We must pass through each of the rank orders or levels as we move to the more complex behaviors. That is, we must have some "knowledge" in a subject area before we can "comprehend" concepts or principles in the same subject area. We must have "comprehension" of principles before we can "apply" these principles to new situations, and so on up the ladder of the taxonomy. Each of the levels in this rank order forms the basis for writing level of learning objectives, as well as our sequencing of lessons within a block of instruction.

Let us next turn our attention to the types of behavior (or learning outcomes) that each of the six levels represents.

a. Knowledge. The recall or recognition of previously learned material (facts, theories, etc.) in essentially the same form as taught.

b. Comprehension. Seeing relationships, concepts, and abstractions beyond the simple remembering of material. Typically involves translating, interpreting, and estimating future trends.

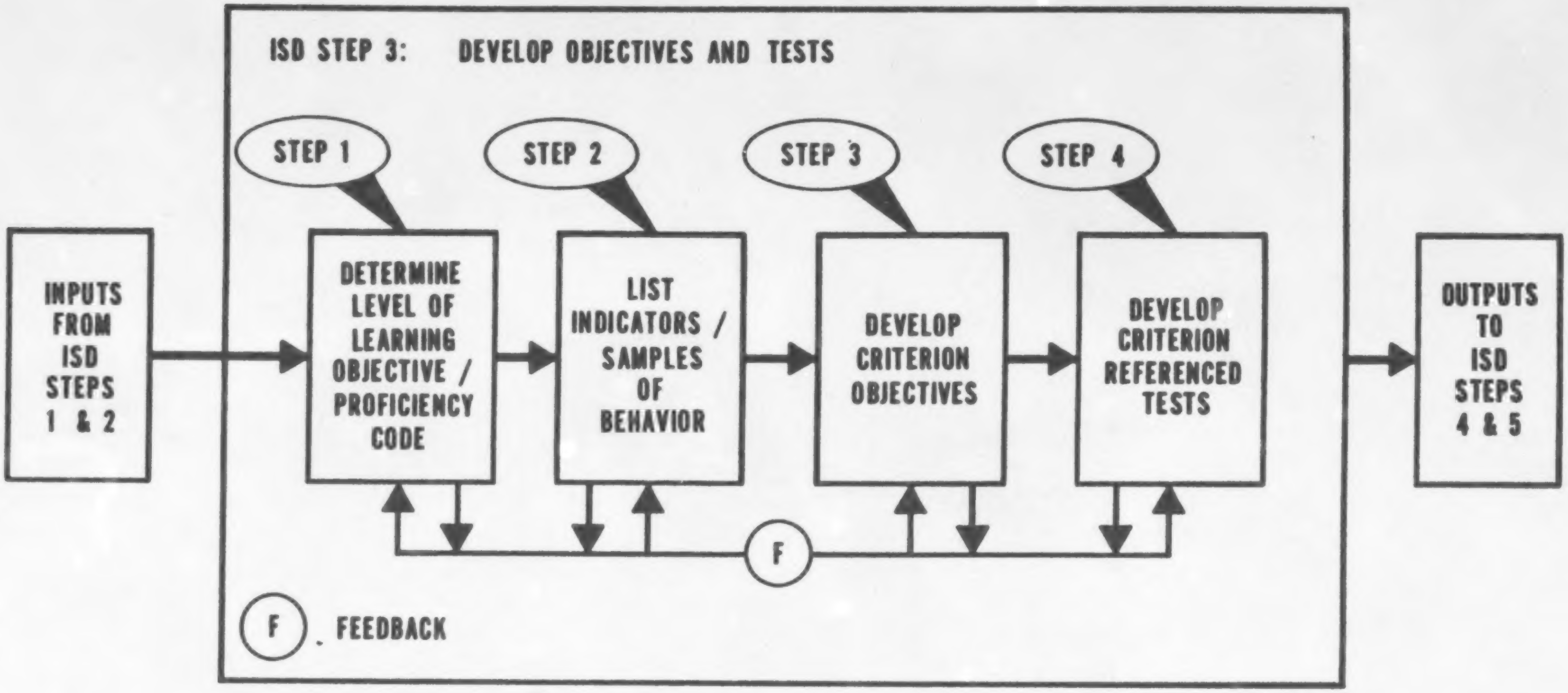
c. Application. The ability to use learned material in new and concrete situations, including the application of rules, methods, concepts, principles, laws, and theories.

d. Analysis. The ability to break down material into its component parts so that the organizational structure may be understood, including the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved.

e. Synthesis. The ability to put parts together to form new patterns or structures, such as a unique communication (a theme or speech), a plan of operations (a research proposal), or a set of abstract relations (schemes for classifying information).

f. Evaluation. The ability to judge the value of material for a given

FIGURE 4-1, FOUR STEP PROCESS FOR WRITING STUDENT - CENTERED OBJECTIVES AND TESTS


ISD STEP 3: DEVELOP OBJECTIVES AND TESTS
INPUTS FROM ISD STEPS 1 & 2
STEP 1
DETERMINE LEVEL OF LEARNING OBJECTIVE / PROFICIENCY CODE
STEP 2
LIST INDICATORS / SAMPLES OF BEHAVIOR
STEP 3
DEVELOP CRITERION OBJECTIVES
STEP 4
DEVELOP CRITERION REFERENCED TESTS
OUTPUTS TO ISD STEPS 4 & 5
F
F - FEEDBACK

purpose. Learning in this area is the highest in the cognitive hierarchy because it involves elements of all the other categories, plus conscious value judgments based on clearly defined criteria.

Experience in reviewing courses from many Air Force schools indicates that well in excess of 90 percent of the material in these schools is taught at the lower three levels of the taxonomy. This fact is not surprising, and with a few exceptions (such as our senior PME schools), the situation is as it should be. In most cases, the higher levels are more effectively reached through on-the-job experience. We will therefore concentrate our attention in this pamphlet on the lower three levels. For those instructors teaching at the higher three levels, we recommend the discussion in the Taxonomy of Educational Objectives Handbook I: Cognitive Domain, ed. B. S. Bloom, et al, New York: David McKay, 1956.

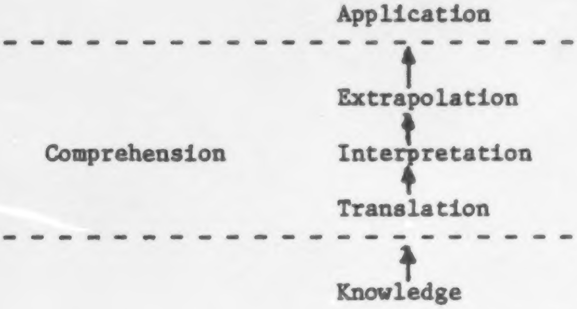
We saw in Chapter 3 that we cannot directly observe such general behaviors as knowledge, comprehension, or application. In order to help us write our level of learning objectives, let us look at some key words or phrases which would reflect knowledge, comprehension, and application.

KNOWLEDGE
* Recall
* Remember
* Recognize
* Memorize
* Store

At this level of the taxonomy we are asking no more than for students to recall or remember information in essentially the same form in which it was given to them. Students may have received this information from lectures, readings, programmed texts, video or audio tapes, or other means. But the source of the information has no bearing on what we expect the student to be able to do to meet our knowledge level objective. The students simply memorize and store information which in turn they give back to us, essentially verbatim, when evaluated.

COMPREHENSION
* Translate
* Interpret
* Extrapolate
  ** implications
  ** consequences
  ** effects

At this level of the taxonomy we go beyond simple recall and attempt to attach a meaning to what is communicated. In doing so, we try to establish relationships between pieces of information in order to form concepts, principles, and generalizations. Within the comprehension level, we can establish what we might call a "mini" taxonomy:



Thus, after reaching the knowledge level, students pass through all three levels of comprehension before they reach the "application" level.

Translation. First, we would expect a student to "translate" material from one form to another. We might, as an example, ask students to tell us in "their own words" what something means. We might ask the students to "paraphrase" a lengthy reading. We might ask them to look at a graph or chart and tell us verbally or in writing what the various parts mean. Or, in a context that we are all familiar with, we might ask to have a passage from a foreign language translated into English. We can see here that we have gone a step beyond simply recalling information. We are now asking the students to give a meaning to what they have learned.

Interpretation. At the second level of comprehension, we are primarily interested in students' being able to see relationships between various aspects of a communication. In order to interpret, they must first "translate" what the individual parts mean, and then see the relationship between these parts. We can see the evidence for interpretation when students perform such activities as making inferences, generalizations, and summations.

Extrapolation. At the third level of comprehension, we want our students to be able to answer the question "What would happen if?" That is, we want them to go beyond the literal message contained in the communication and make predictions of consequences or trends. We would also expect the students to be able to say with some reasonable degree of accuracy the probability of their prediction--not statistical probability necessarily, but general probability, such as "it would very likely happen" or "it's only slightly probable." The following example illustrates the three levels:

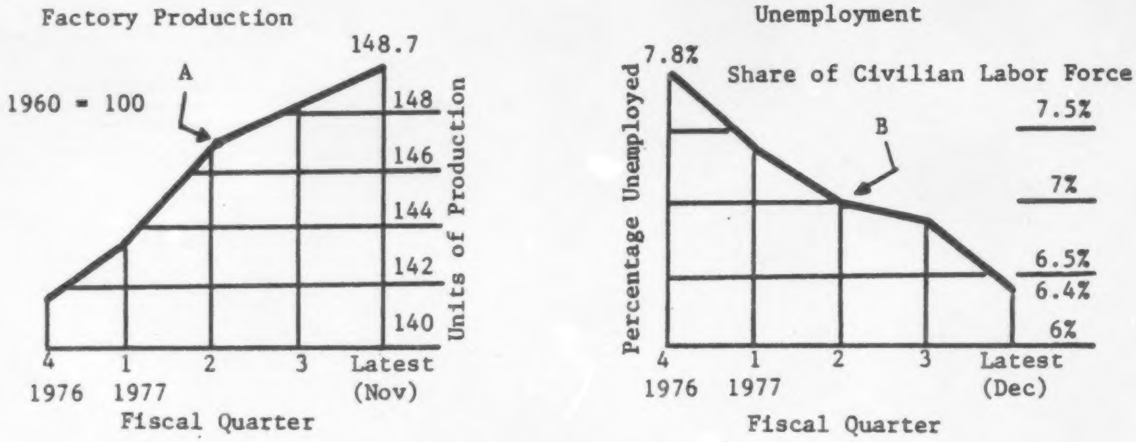


Figure 4-2

Let us assume that we want our students to "comprehend" the relationship between factory production and unemployment as illustrated in these two graphs (Figure 4-2). First, we would want to be sure the students could "translate" the information contained in the graphs. For instance, we might ask students to tell us what Point A on the "Factory Production" graph and what Point B on the "Unemployment" graph represent. If they can successfully "read" the graph, they have demonstrated the ability to "translate" from graphic to verbal or written form.

Our next step, "interpretation," would be to ask students to identify the relationship, at least as illustrated by the two graphs, between

"Factory Production" and "Unemployment." Now, simply knowing the meaning of Point A and Point B is no longer enough. The students must now see each graph as a whole (i.e., factory production has increased, unemployment has decreased) and then make a generalization concerning their relationship (i.e., "as unemployment decreases, factory production goes up" or "there is an inverse relationship between unemployment and factory production").

Finally, we could evaluate our students' ability to function at the "extrapolation" level. Suppose we asked the students the following question: "Based on the trends illustrated in the two graphs, predict the level of factory production at the end of the first quarter of 1978." Here we have asked the students to go beyond the literal communication (i.e., the two graphs) and answer the question "What would happen if?" If they can extrapolate, students are able to function at the highest level of comprehension.

Before we leave comprehension, we should keep in mind two general concepts when writing objectives at this level.

First, we can think of all levels of the taxonomy above knowledge as increasingly complex levels of "understanding." Students can be asked to "predict" at any of these levels. Again, referring back to our graphs: at some higher level of the taxonomy students could bring in many other factors in addition to unemployment (such as interest rates, sales predictions, energy sources) to make a prediction of factory production. However, at the extrapolation level of comprehension, the prediction must be based only on the information the students are given in the literal communication (i.e., the two graphs).

Second, if our course is designed to bring students to the application level of learning, we must insure in our comprehension level objectives that we bring students through the extrapolation level of comprehension.

APPLICATION
Solve
Compute
Use
Construct
Modify

At the application level of the taxonomy, we are asking our students to take the concepts and principles they have formed at the comprehension level and put them to use in situations new to them. For example, suppose we have just completed a block of instruction in which our students learned to comprehend several concepts of management. Further, one of the concepts they learned was "delegation of authority." Now, we want to evaluate their "application" of the concept. We might give them a scenario of an Air Force organization in which the concept of "delegation of authority" was violated, causing problems in the organization. We would then ask them to read the scenario and give us their solutions to the problem. We would not tell them which concept was being violated. Our criteria for evaluation would then be for students to solve the problem by applying the "delegation of authority" concept to the organization described in the scenario.

Many instructors have difficulty in differentiating between application and the higher levels of comprehension, and indeed the difference can sometimes be confusing. However, if we keep the following ideas in mind, distinguishing between the two should not be difficult.

At the comprehension level, students are able to demonstrate the use of a principle or concept when the principle or concept is identified. At the application level, when given a problem situation, students must identify the concepts and principles involved by themselves, and then demonstrate use of the principle or concept in solving the problem. At the comprehension level, then, students demonstrate use of an identified concept or principle. At the application level, students use the concept or principle when confronted with a problem situation new to them.

For example, in the "delegation of authority" situation, if we tell students that the scenario involves the misuse of "delegation of authority" and then tell them to solve the problem, they are working at the comprehension level. But by not telling them which concept is being violated and by making them come to this determination by themselves, we ensure they are working at the application level.

As we have suggested, the application level of the taxonomy is the time when students first encounter the "problem-solving" process. Application is, or should be, the level of learning that most Air Force schools attempt to reach. Just because students "comprehend" concepts and principles, we have no guarantee that they can "apply" these concepts and principles in new situations. The opportunity for practice of these "application" level of learning activities must be provided for our students before we can expect them to function at this level.

Before we leave the application level, let us be sure we are clear on an area which often presents problems to both students and instructors. The word application, as used as a cognitive level of learning, is not synonymous with the meaning of the word as we use it in our everyday speech. If we put this in terms of educational objectives, the term "apply" is not necessarily synonymous with the term "be able to." We find the confusion here most prevalent in dealing with skill development. Suppose we use the objective "Be able to solve an algebraic equation for one unknown." If we think back to our high school or college algebra courses, most of us can remember how we learned to meet this type of objective. We simply memorized the rules which applied and used these rules to solve the equation. Seldom was there any effort on our part, or the teacher's, to have us comprehend the meaning behind the rule. Thus, we could solve the problem, but were not really at the application level of learning. We often saw the results of this type of learning when we were asked to solve "word problems" in algebra or other types of mathematics, where we needed a comprehension of the concepts and principles involved to solve the problem.

There is a clear implication here for instructors and curriculum developers. If our students are to be expected to "problem-solve" or "trouble shoot" on the job, then they must be at the "application" level of learning, and, to get there, they must have satisfactorily passed through the lower levels of the taxonomy.

Level of Learning (LOL) Objectives

A level of learning objective, as introduced in Chapter 3, contains three elements:

Student-centeredness
Level of Learning
Specific Subject

Let us now take a closer look at the function that each of the three elements serve.

a. Student-centeredness. Since the purpose of any educational objective is to express the outcome of the lesson in terms of learner behavior, this part of the LOL objective ensures that our focus is on the word "student." We might want to write this portion of the objective as "The objective of this lesson is for each student to...."

However, since this part of the objective is a given, we can infer that all our objectives have this as an opening statement, whether it is actually written or not.

b. Level of Learning. Every objective should state the level of the taxonomy we expect our students to reach by the end of a period or block of instruction. By using an ISD or systems approach to curriculum development, this decision may have already been made in steps 1 and 2.

c. Specific subject. Level of learning objectives may be written to varying degrees of specificity. For example, if we are writing a level of learning objective for an entire block of instruction, which could include many hours, than our subject might be quite general. Normally, as we write objectives toward smaller and smaller units of instruction, the objectives become more specific.

Let us examine the three elements of the level of learning objective as we relate them to an example from a block of instruction in educational evaluation. We will assume for this example that we plan to devote thirty hours to achieve our block objective.

Block Objective: Apply the principles of test construction, performance rating, and test analysis to assess student achievement of objectives.

Period 1 (2 hours): Know the mechanics for writing selection (multiple-choice, true-false, and matching) and supply (essay, short answer, and completion) test questions.

Period 2 (2 hours): Know the procedures for planning, constructing, and grading selection and supply tests.

Period 3 (2 hours): Comprehend that testing is a useful tool in assessing achievement of student learning.

Period 4 (4 hours): Apply principles and techniques of classroom test construction to measure student achievement.

a. Student-centeredness. As can be seen, we chose not to include the statement, "The objective of this lesson is for each student to know (comprehend, apply)..." But we can also see that this statement is implied in each of the objectives above.

b. Level of Learning. Each objective contains a specific level of learning (know, comprehend or apply) level is contained in each objective. For this reason, we should always state the highest level that we want our students to reach in the period or block of instruction.

c. Specific subject. How specific to make the subject of the lesson normally depends on two variables:

(1) The scope of the content covered by the objective.

(2) The level of learning.

In the example above, the block objective (at the application level) is quite general because of its broad scope, and we would not expect our students to meet this objective until after many hours of instruction. At the other end of scale (the know level), both Period 1 and Period 2 objectives are very specific. Our basic guideline in this area is to make objectives as specific as we can. The more specific the objective, the easier it will be to plan lessons and assess achievement of the objective.

Note that the block objective includes 3 major elements of content: (1) principles of test construction, (2) performance rating, and (3) test analysis. Up to this point we have dealt with only the first element of our block objective (i.e., principles of test construction). We would now proceed to write period objectives for performance rating and test analysis. We will not continue this procedure in this example, but the same logical progression would be used—starting our students at the knowledge level and progressing through application.

SAMPLES OF BEHAVIOR

We have previously discussed our inability to observe directly students "knowing," "comprehending," or "applying." But both instructors and students need to know how well the level of learning objectives have been achieved. Thus, we need a vehicle which will give us a base on which to plan our evaluation of the achievement of level of learning objectives. The vehicle we use is called a sample of behavior.

We can define a sample of behavior as a statement which specifies one of several observable behaviors which students should be able to demonstrate at the end of a period or block of instruction and which gives us evidence that they have achieved our objectives. These samples eventually become the basis for our evaluation, most often in the form of test questions. The actual process of converting these samples to test questions will be covered in Chapter 22.

The word evidence is the key here. There may be a great many behaviors we would expect students to demonstrate to us as evidence that, for example, they "comprehend" a concept or principle. In fact, there would be far more ways than we could ever have time to observe and evaluate. For this reason, we list a reasonable number (a sampling) of behaviors which are as equivalent in nature as we can possibly make them. We conclude that if students can demonstrate these behaviors, they would be able to demonstrate others. This sampling procedure is the same as any other sampling procedure—the larger the sample, the greater confidence we can put in the evidence obtained.

Certain behavioral verbs tend to lend themselves to use at each level of the taxonomy. A partial listing follows:

Level of learning	Sample behavioral verbs
Knowledge	list, name, match, describe, define, state, outline, identify, select, explain, give an example, state
Comprehension	explain, compare, contrast, differentiate, predict, summarize, generalize, paraphrase, distinguish, solve, compute, identify, give an example
Application	solve, compute, prepare, use, develop, construct, modify, conduct, identify, teach

When we use any of these verbs in a sample of behavior, we cannot guarantee that the sample is written at any particular level of learning. The activity following the behavioral verb determines the level at which the student will respond to the sample. The whole sample of behavior must be looked at "in context." But, as a general rule, we use verbs of these types at each of the levels.

As a corollary, the same verb may be used at several different levels of the taxonomy. Take, for example, the word "identify." In the listings above, we found this word shown at the knowledge level. This was because it is primarily associated with this level. But let us look at how this word could be used at three different levels of the taxonomy.

Knowledge

Objective: Know the five steps in the ISD process.

Sample of Behavior: Identify "develop objectives and tests" as the third step in the ISD process.

Here, our sample is calling only for recall of specific information.

Comprehension

Objective: Comprehend that criterion lesson planning focuses instruction on student achievement of limited, precise learning outcomes.

Sample of Behavior: Given three logical examples of student learning outcomes, identify the one best suited for a criterion objective.

Here, we are giving the students three examples of student learning outcomes that they have not seen before. Their job then becomes to see the relationship between what they have learned about criterion objectives and the three statements.

Application

Objective: Apply the management concept of "delegation of authority" to a problem situation.

Sample of behavior: Given a scenario in which a problem has arisen due to the misuse of delegation of authority, identify the best solution to the problem.

Here we have asked the student to solve a problem (identify the solution) by applying a previously learned concept to a new situation.

By themselves, then, behavioral verbs do not give us assurance of a specific level of learning. They must be looked at in context with the total behavioral statement.

Considerations in Writing Samples of Behavior

1. Kind of verb. First, the verb must reflect an observable behavior. Second, there should be a good variety of verbs. Thus, if our objective was at the comprehension level and we decided to write five samples, we would not want all of our samples to specify "explain." Instead, we might have one sample using "explain," and others with "differentiate," "compare," "paraphrase," "predict," and so forth. These samples would give us a wide variety of behaviors on which to base our judgment that the student "comprehends" our objective.

2. Level of learning. The sample must reflect the same level of learning as specified in our objective. If the sample is written at a higher or lower level it will invalidate our effort to assess achievement of the objective at the specified level.

3. Evidence of achieving objective. The sample should give us significant evidence that our objective has been achieved. Since we may be limited in the number of samples that we can test, we cannot afford to write samples dealing with trivial or peripheral information.

4. Clarity. The samples must be clear, simple, and concrete. Clarity will help us as instructors as we devise our evaluation instruments. More importantly, if we give the sample to students—and we should do so—students will know for what they are being held responsible.

5. Number of samples. There is no magic number of samples. Instructors or curriculum developers must determine the number that will satisfy them that the students have met the objectives. Normally, though, we would have a much greater number at the knowledge level than at the higher levels. Since we are dealing at the knowledge level with the recall of a good deal of factual information, we will probably require a great many samples to cover a reasonable amount of information. As we move to the higher levels of learning, we will need fewer samples, but usually more complex ones. As a general rule, we should have at least two samples for each objective. If we will accept only one behavior, then we should go directly to step 3 of the 4-step process and write a criterion objective rather than a sample of behavior.

6. Time available for evaluation. Ideally we would want to test our students on every sample of behavior that we write. Realistically, because of time, testing all samples is not always possible. There are two basic alternatives to this problem:

a. We can write only the number of samples we will have time to test.

b. We can write the number of samples we think will adequately evaluate the objective, but actually test only a sampling of the samples.

Based on the assumption that students will be given the samples as a part of the course overview, alternative 2 is preferred. The primary drawback with alternative 1 is that many students will key in on the small number of samples and disregard the rest of the material. By using alternative 2, students can identify all of the key ideas we want them to get from the lesson, but will have no way of knowing which of the samples we will test. Thus they are forced to study all of the key material we have indicated in the samples.

The primary deficiency in this system is that we get no feedback on student learning from those samples we do not test. However, if we teach a course given several times a year, we can use alternate tests and, perhaps over a period of several classes, test all of the samples.

What do we sample? The answer to this question might appear obvious--our objectives. And that is true. But the next question that must logically follow would be--which objectives? The answer to this question must be based on two variables:

a. The structure of our evaluation program.

b. The use to be made of the evaluation results derived from the samples.

Let us now examine each of the two variables to see how we can determine which objectives should be sampled.

The structure of our evaluation program

Typically, the curriculum for an Air Force school might be designed in the following hierarchy:

- Mission statement
  - Course objectives
    - Area or phase objectives
      - Block objectives
        - Period objectives

Although we would probably never write samples from our mission statement, since it would simply be too broad to work with, any of the other levels of a course could be sampled. The key to which should be sampled is based on our evaluation program. If we have a program, most often seen in our longer PME courses, where tests are given after very large blocks of instruction and in the form of very comprehensive essay exams, then writing samples for the course or area objectives might be all that is necessary.

On the other hand, in our shorter courses, or where testing is conducted relatively often on shorter blocks of instruction, it would be more feasible to write our samples on block or period objectives.

The use to be made of evaluation results

If the primary purpose of all of our testing is summative in nature (i.e., used to determine students' grades or whether they pass or fail), then the guidelines in the preceding discussion (structure of evaluation program) are all that we need. However, many schools use formative, often referred to as diagnostic or enroute, evaluation. That is, some tests are given, not for grades or pass-fail, but only to give students and instructors feedback on student progress. In this situation, we might want to write samples for every period or block of instruction, even though summative evaluation might be based only on samples from area or course objectives. If your school or course falls in this latter category, there is a key point to keep in mind. Never use samples designated only for formative evaluation in an evaluation mode which is summative in nature. What most often happens when this mistake is made is that we end up testing peripheral or trivial information instead of our primary objectives. See Section D for a further discussion of evaluation concepts including formative and summative evaluation.

Summary

The level of learning objective is our first step in describing student learning outcomes.

Knowledge level objectives state outcomes where recall of specific information is our primary concern. Comprehension level objectives state outcomes which require students to give meaning to what they have learned, establish relationships, and extrapolate beyond the literal message of a communication. Application level objectives and above require the student to put into use previously learned concepts and principles in increasingly more complex situations.

Samples of behavior allow us to evaluate student achievement of level of learning objectives. Samples are statements which specify an observable behavior which students should be able to demonstrate at the end of a period or block of instruction, and give evidence that the students have achieved our objectives. Samples are always written at the same level as the objective.

Chapter 5

WRITING CRITERION OBJECTIVES

Introduction

A criterion objective is a word picture of what we expect students to do if they have learned what we taught. As introduced in Chapter 3, Writing Student Centered Objectives, the criterion objective is one of the four important steps in going from a general, non-behavioral objective to a very precise test item (Figure 5-1). This chapter will deal with criterion objectives as planning tools by illustrating their content and formats, describing many of the errors made in writing them, and providing some insight into ways they can be used to sequence instruction.

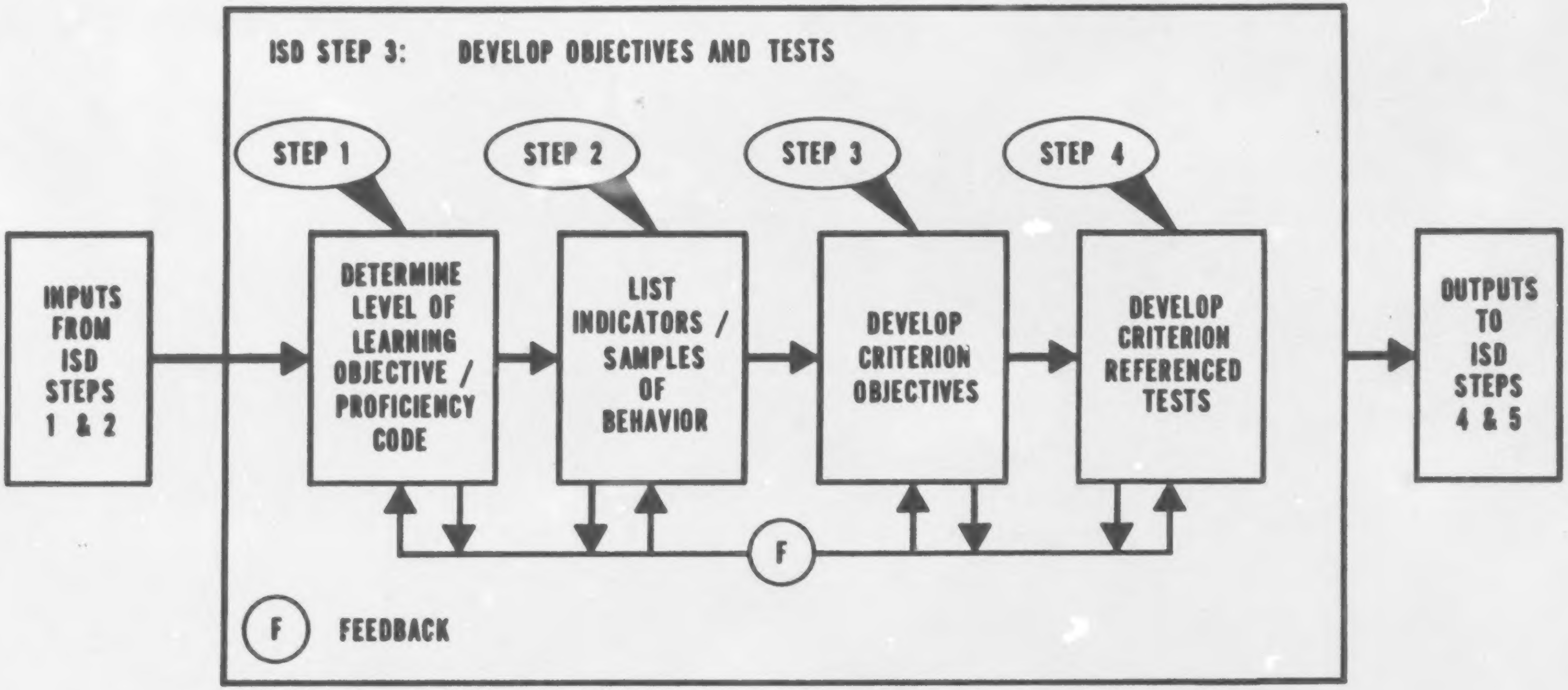
The criterion objective, a description of a test item or a measurement situation, ranges in length from a sentence or two to many paragraphs. A simple criterion objective might read, "Without the use of references, name all 3 parts of a criterion objective." More complex criterion objectives are illustrated later in this chapter and in Chapter 22, Measuring Learning Outcomes. The criterion objective may be written and given to students, or it may exist only in the minds of instructors as they prepare test items to measure learning. In either event, the most efficient way to describe what students should learn is to describe carefully what they will be able to do if instruction has been successful. The assumption made in this chapter is that the objectives will be written down and given to students and others.

When we stop to think about it, the idea of expressing objectives or expectations in measurable terms is already familiar to us. We are used to reading the raised lettering on an automobile tire which tells us that it should be inflated to 32 pounds of pressure while the tire is cool. Through Saturday afternoon television, we know that a world class sprinter can run the 60-yard dash in 6.1 seconds, indoors and timed electronically. In both cases, we describe the performance of the subject in measurable terms. We can tell what the subject does in a test. We also know about the environment and the quality or quantity of the performance.

In our Air Force experience, as well, we can understand the requirement for an Air Force manual to be written at a specific grade level (as measured in some standardized way). We ask airmen in basic training to name each major air command or list in order all enlisted and officer ranks without error. In a management course, we might expect the successful student to propose a solution to a particular type of personnel problem. In each of these instances, we have the beginnings of a fairly precise and quite easily understood instructional objective.

With very little additional information, two of us, each competent in a particular field, could agree whether a student had achieved our objective. Once we agree on the information

FIGURE 5-1, FOUR STEP PROCESS FOR WRITING STUDENT - CENTERED OBJECTIVES AND TESTS


ISD STEP 3: DEVELOP OBJECTIVES AND TESTS
INPUTS FROM ISD STEPS 1 & 2
STEP 1
DETERMINE LEVEL OF LEARNING OBJECTIVE / PROFICIENCY CODE
STEP 2
LIST INDICATORS / SAMPLES OF BEHAVIOR
STEP 3
DEVELOP CRITERION OBJECTIVES
STEP 4
DEVELOP CRITERION REFERENCED TESTS
OUTPUTS TO ISD STEPS 4 & 5
F
F FEEDBACK

needed to express an objective, it is easy for us to communicate the objective and measure it. Concern about clear communication and consistent evaluation is the primary reason for the use of criterion objectives in the planning of instruction.

Relationship Between Samples of Behavior and Criterion Objectives

Figure 5-1, first explained in Chapter 3, illustrates the relationship between samples of behavior (performance or task statements) and criterion objectives (statements of performance, conditions and standards). Each of the planning steps in Figure 5-1 becomes more specific and more measurable as we go from the general objective statement to the very precise test item. Although our objective is often to change what a student thinks or feels, we are forced to measure learning by behavioral change because we cannot look into the student's head to see whether learning has taken place.

The difference between a sample of behavior and a criterion objective is that the objective is more specific and detailed as to standards and conditions. A comprehensively written sample of behavior may contain all the elements of a criterion objective. A brief, simple criterion objective may read like a sample of behavior if either or both the conditions or standards are assumed. Rather than split hairs about where the sample of behavior leaves off and the criterion objective begins, remember that the sample generally contains just a statement of performance. The criterion objective generally goes into more detail by adding standards and conditions to the performance statements. See the samples in Figure 5-2 below as well as those later in this chapter for a comparison of samples of behavior and criterion objectives.

Illustrative Samples of Behavior	Interpreted as a Criterion Objective
1. define...(insert term)	without the use of references, define ...according to AFM xx-xx. (knowledge)
2. give an example of... (insert concept)	given the concept of...as developed in class, give a new example of (insert concept) consistent with its attributes. (comprehension)
3. write a position paper on ...(insert subject)	using the library and local experts and a topic assigned from the area of..., write a position paper which meets the content and format standards provided in class and in the assigned text. (application)

A Comparison of Samples of Behavior and Criterion Objectives

Figure 5-2

Elements and Formats

The content of a criterion objective is far more important than the format that is used to communicate it. But format can and does affect what we read and understand, so agreeing on a basic format and elements are important steps. We can be sure that we will not leave out any significant information in our instructional objectives by agreeing on and sticking to formats which include all of the essential elements of information needed to describe learning outcomes.

Essential Elements

Both Air Force and civilian educators have agreed that there are certain items of information which must be included in a well-stated criterion objective. While many authors have different labels for these items of information, there is general agreement that criterion objectives should include the following:

Conditions--a description of the testing environment including those problems, materials, and supplies which will be given (included) or specifically excluded from a measurement situation.

Performance--the observable student behavior (or the product of that behavior) which is acceptable to the instructor as proof that learning has occurred.

Standards--the qualitative and quantitative criteria against which student performance or the product of that performance will be measured to determine successful learning.

Formats

The precision and exact language of a criterion objective will vary from instructor to instructor. The final product from any instructor, however, should be a clear statement which communicates the intended outcomes of learning. A common format for writing objectives makes communicating easier. Both the reader of the objective and the writer know in advance the type of information which will be contained in the objective. Writing a criterion objective, though, is more than an exercise to satisfy an official requirement. An objective that meets the format requirement but does not communicate fully is worse than no objective at all. An instructor can send students on a wild goose chase by giving them a criterion objective which does not honestly reveal what will be taught and tested. This practice results in two curriculums, one which exists on paper and the real one used in the classroom.

The order in which the elements of a criterion objective are written does not matter, although the common sequence is (1) conditions, (2) performance or behavior, (3) standards. While generally written as a sentence or short paragraph (Example 1, Figure 5-3), criterion objectives may also be written in columns (Example 2, Figure 5-3). The sentence or paragraph format lends itself to easy reading and efficient use of space in catalogs or lesson plans. The columns may be layered vertically (Figure 5-7) or side by side (Example 2, Figure 5-3). The column format avoids questions of grammar and punctuation and lends itself to worksheets used to construct objectives.

FORMATS FOR CRITERION OBJECTIVES

Example 1

Narrative:

Level of Learning Objective: Apply appropriate principles to the construction of comprehension level test items.

Sample of Behavior: Edit multiple choice test items.

Criterion Objective: (Conditions) Given a comprehension-level multiple choice test item with one or more errors in construction (PERFORMANCE) EDIT THE ITEM *(Standards) so that all construction errors identified in rating scale AI-XXX have been eliminated.*

Legend: Conditions, PERFORMANCE, *Standards*

Example 2

Columnar:

Level of Learning Objective: Evaluate course documents to determine consistency with concepts and principles of ISD.

Sample of Behavior: Critique course proposals.

Criterion Objective:

PERFORMANCE	Conditions	*Standards*
PREPARE A WRITTEN CRITIQUE OF THE PROPOSED COURSE.	Given: 1. a proposal for a new course with the following supporting documents: a. system requirements b. lesson plans c. criterion objectives d. assigned readings e. examinations 2. AFM 50-62 3. AFM 50-2 4. AFP 50-58	1. *All deviations from the manuals and pamphlet noted.* 2. *At least one plausible suggestion for improvement offered for each deviation noted.* 3. *Written critique free from errors in spelling, grammar, and punctuation.*

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-3

For some sophisticated instructional systems, the column format may be preferable for another reason. With the objective broken out by element into columns, it is easier to analyze. We can tabulate the supplies and materials needed for instruction by analyzing the conditions column. If we examine the performance column on several plans, we may find that different instructors are making students do the same things. It might then be more efficient to have a common unit of instruction which could save duplicated effort. Analysis of the standards column could reveal questionable or ambiguous standards. Both formats for writing criterion objectives require the same elements of information, but the column format may make data gathering and analysis easier.

Mastery Learning

Students who achieve the criterion objective are often said to have "mastered" the objective. The term "mastery learning" has become strongly associated with criterion objectives and with tests which measure the achievement of criterion objectives. From the point of view of criterion objectives, however, mastery does not mean that a student must perform a task or apply a principle with 100 percent accuracy. Mastery means that the student can demonstrate achievement of the criterion objective at the level of proficiency stated. The proficiency level may well be 100 percent accuracy, but it may also be any other percentage or standard appropriate for the objective. The decision as to whether a student has achieved an objective is essentially a "yes/no" decision. Regardless of the error rate permitted by the objective, if students can perform under a given set of conditions to the standards stated in the objective, we say that they have mastered the objective. See Chapters 20, 22, 23, and 24 for a further discussion of criterion referenced measurement which explains these concepts further.

Content Communicated by the Criterion Objective

Criterion objectives should be as simple and straightforward as possible. They are designed and written to communicate. Because good communication is the ultimate goal, no absolute set of rules for constructing a criterion objective can be provided. The suggestions here may be of assistance in writing better objectives, but they cannot be used to defend objectives which satisfy the format but do not communicate well.

No criterion objective can express all of the possible conditions, performances, or standards for measuring student achievement. However, the criterion objective is one of the best devices for communicating between two or more reasonable people. The content of a criterion objective should be constantly reviewed to make sure that format and jargon do not get in the way of full and accurate communication. Even though our criterion objective may seem clear to us, the objective is unsatisfactory if our students find it unclear or incomplete.

With the experience gained in writing criterion objectives for both academic and technical instruction, we can make some generalizations and establish some ground rules. We should keep the following points in mind as we write statements of conditions, performance, and standards.

Conditions

A well-written condition statement will tell students what to expect when they are evaluated. What will they encounter, for instance, when they sit down to solve a problem or answer a test item? Will they have a simulated management problem to solve or just a word list from the text? If students are to write or speak on a topic, who will select the topic and what outside help may they seek? This kind of information gives students a context for their evaluation. If we describe the conditions well, our students can spend less time second guessing us on how we are going to test them and more time learning the material.

If we remember that we are trying to draw a word picture, condition statements for physical tasks or performance items are relatively simple. Figures 5-4 through 5-7 contain illustrations of criterion objectives which require overt, physical performance on the part of the learner. The condition statements should be easy to identify even without the highlighting. The description contained in the criterion objective provides an adequate word picture of the conditions under which the learner will be tested. Generally speaking, criterion objectives which call for overt student behavior give a fuller accounting of equipment, materials, and other physical factors in the environment than do objectives requiring responses to paper and pencil items.

Condition statements for paper and pencil test items, Figures 5-8 through 5-12, are written with the same techniques as those for performance testing. However, many instructors find them more difficult to write. In paper and pencil testing, it is usually more difficult to actually observe each of the elements (conditions, performance, and standards). Often we see only the product of the performance, such as a research paper, rather than actually observing the writing of the paper. But the elements are still present, and the word picture for the paper and pencil test requires no less precision than with performances.

The condition statements in the paper and pencil testing, particularly Figures 5-9 through 5-12, focus more on the problem presented to the student than they do to the physical environment. In addition, by carefully manipulating the conditions of testing, we can produce criterion objectives which measure a wide range of knowledge and understanding. See the level of learning indicated for Figures 5-3 through 5-12. The condition statements specify or assume those conditions which allow the student to perform at the level of learning indicated for each example.

Common Errors

As we write condition statements for criterion objectives, we may find ourselves making errors which are common to many writers. Some of these errors are predictable and can be anticipated:

1. Mixing the outcomes of learning with the process of learning. Statements such as "by the end of this course" or "after a lecture by the base commander" are generally not appropriate in a criterion objective. Remember, we are describing the test, not giving a course outline. If we include information like this, we are saying that part of the testing situation includes attending the course or listening to a lecture by the base commander--which is probably not the case.

Figure 5-4

Criterion Objective

Type of Testing: Performance

Level of Learning Objective: Wrap ankle in elastic bandage (K)*

Sample of Behavior: Wrap ankle in elastic bandage

Criterion Objective: Given a simulated patient requiring an ankle wrap and without assistance or references, WRAP THE ANKLE WITH AN ELASTIC BANDAGE *correctly according to checklist EB-3.*

Analysis: We are asking students to copy a simple task (wrapping the ankle). Following a memorized procedure, they will reproduce a model for such wrappings on a simulated patient. This task is much like folding a flag, replacing a spark plug, or arranging ribbons and devices worn by members of the armed forces. These tasks can be performed from memory with little "understanding" required of the performer. Students need no special skills to perform the task. If there were special psychomotor skills required, we could specify them and the level of learning.

*Alternative way to write level of learning objective emphasizing one behavior to the exclusion of others. Although other samples of behavior are available, this one is considered critical and will be the focus of instruction and testing. Knowledge level of learning indicated by (K). Could also be written as, "Know how to wrap ankle joints."

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-5

Criterion Objective

Type of Testing: Performance

Level of Learning Objective: Apply appropriate principles and techniques to troubleshooting and repairing electrical circuits.

Sample of Behavior: Locate and repair malfunctions in PGN electrical circuit board.

Criterion Objective: THE STUDENT WILL LOCATE AND REPAIR MALFUNCTIONS IN A PGN ELECTRICAL CIRCUIT BOARD. These malfunctions will be limited to shorts and incomplete circuits planted by the instructor at those points most often affected by these malfunctions. Repair manual PGN-1, schematic drawings, screwdriver, pliers, standard electrical meters, and supplies as necessary may be used. *Seventy-five percent of all planted malfunctions must be identified and repaired, with a 10-minute time limit for each.*

Analysis: Although two verbs are used in the performance statement, the requirement to "locate and repair" can be dealt with as a single objective. It may be inconvenient to separate closely associated tasks into separate objectives. If the need exists, however, each action verb could be used as the basis for a separate objective. Each of the three essential elements, performance, conditions, and standards, is stated as a separate sentence. These sentences could be arranged in any order. The general condition statement describing the malfunctions is satisfactory, although more detail could be added if it served a useful function.

Legend: PERFORMANCE, Conditions, *Standards*

Figure 5-6

Criterion Objective

Type of Testing: Performance

Level of Learning Objective: Prepare routine Air Force administrative forms (A)*

Sample of Behavior: Prepare a typewritten AF Form 9

Criterion Objective: Given the following purchasing information: name and description of item, stock number (if available), quantity and unit cost, whether the request is recurring or non-recurring, a reason to purchase, and a date by which the item is needed, PREPARE A TYPEWRITTEN AIR FORCE FORM 9, REQUEST FOR PURCHASE, according to Volume 1, AFM 70-322, with no errors in typing, spelling, or format, free from math errors, and with correct organization number and fund classification code.

Analysis: This condition statement is quite specific because it lists each of the bits of purchasing information. An acceptable substitute would also be "given the necessary information." Although the standards indicate that both the typing and math are to be error free, we could assume this requirement if it was omitted. There is no time standard given, so we can assume that any problem used in this exercise will be field tested and a "reasonable time" allowed based on actual experience.

*Alternative way to write level of learning objective emphasizing one behavior to the exclusion of others. Although other samples of behavior are available, this one is considered critical and will be the focus of instruction and testing. Application level of learning indicated by (A). Could also be written as, "Apply appropriate typing and computational skills to the preparation of routine Air Force forms."

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-7

Criterion Objective

Type of Testing: Performance

Level of Learning Objective: Apply correct procedures to the administration of parenteral therapy

Sample of Behavior: Start intravenous (IV) fluids in arm or hand.

Criterion Objective:

Conditions:

1. Given a physician's order to start intravenous fluids
2. a cooperative, conscious adult patient
3. a routine situation in which extraordinary measures are not required
4. equipment and supplies, including
    a. IV fluid (as directed) in bag or bottle
    b. Tubing
    c. Alcohol swabs
    d. Needle
    e. Tape
    f. Arm board
    g. Tourniquet
    h. IV pole

PERFORMANCE: START INTRAVENOUS FLUIDS IN ARM OR HAND.

Standards:

1. *Compliance with all hospital procedures and Air Force regulations (including presentation of self and proper identification of patient against orders).*
2. *Acceptable nursing practice for procedure (cleansing of puncture area, site and application of tourniquet, and blood return).*
3. *No swelling above puncture.*
4. *Flow regulated to rate directed by physician's orders.*
5. *Patient discomfort not to be excessive for procedure considering condition of skin and visibility and condition of veins.*
6. *Task to be performed without assistance.*

Analysis: This is a very significant task and a lengthy objective. However, there are several bits of information which limit the scope of the task. Notice that the intravenous fluids are to be started in the arm or hand. Other locations for administering these fluids, such as the foot or jugular vein, are not included. In addition, the conditions rule out children, comatose patients, and hostile adults. The listing of equipment and supplies is quite complete, but they could have been assumed with a statement such as "given all necessary equipment and supplies." Several of the standards require judgment, but no useful purpose would be served by making them more precise (e.g., how much discomfort is excessive?). Notice that the first standard deals with a large amount of information by referring to two external sources for information.

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-8

Criterion Objective

Type of Testing: Paper and pencil

Level of Learning Objective: Know the essential elements of the Instructional System Development (ISD) model.

Sample of Behavior: List the steps of the ISD model.

Criterion Objective: With the use of references, LIST THE STEPS OF THE USAF ISD MODEL *according to AFM 50-2, in order and without error.*

Analysis: This criterion objective sets up a short answer test item. If the test item were to be multiple choice, a different criterion objective would be required. The conditions and standards in this criterion objective could have been assumed, but spelling them out in this way leaves less room for misunderstanding.

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-9

Criterion Objective

Type of Testing: Paper and pencil

Level of Learning Objective: Comprehend the concepts of racially and ethnically degrading behavior

Sample of Behavior: Recognize instances of racially or ethnically degrading behavior.

Criterion Objective: After viewing a videotape recording which recreates a discussion between persons of different racial or ethnic backgrounds and which contains a number of instances of spoken and nonverbal communication which have been labeled by the Base Human Relations Council as racially or ethnically degrading, IDENTIFY *at least two-thirds of* THOSE INSTANCES.

Analysis: This criterion objective again calls for students to exercise their understanding of a situation to see how well they agree with a panel of experts. As the level of learning is relatively low, we should probably use a checklist or other criteria. Notice that the objective assumes that students will be doing the task on their own and within a reasonable, but unstated, period of time. This approach is correct as long as there is no apparent need to spell out supervision constraints and time standards.

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-10

Criterion Objective

Type of Testing: Paper and pencil

Level of Learning Objective: Compute phi coefficient (Ø) (C)*

Sample of Behavior: Compute phi coefficient problems.

Criterion Objective: Given problems calling for the computation of a phi coefficient, the number of persons who have correctly and incorrectly responded to a particular test item, and without assistance, COMPUTE THE CORRECT PHI COEFFICIENT *in 80% of problems given.*

Analysis: As with most problems in computation of this type, the students must understand enough of the process to translate the problems given and interpret the formula well enough to substitute the correct values. Students can't depend on simple recall, such as reciting the multiplication tables or recalling memorized formulas, e.g., πr^2. It is less than application level because students are told which process, formula, or statistic is needed to solve a given set of problems. If they had to determine the right way to solve a problem from several possibilities as well as to solve it, the task would be at the application level.

*Alternative way to write level of learning objective emphasizing one behavior to the exclusion of others. Although other samples of behavior are available, this one is considered critical and will be the focus of instruction and testing. Comprehension level of learning indicated by (C). Could also be written as, "Comprehend the computation of the phi coefficient."

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-11

Criterion Objective

Type of Testing: Paper and pencil

Level of Learning Objective: Apply understanding of the UCMJ to real or simulated Air Force situations.

Sample of Behavior: Identify violations of UCMJ

Criterion Objective: Students will be given 5 scenarios with descriptions of misconduct punishable under the UCMJ and 3 articles from the UCMJ which may have been violated (multiple choice test item). Without assistance, notes, or references SELECT THE ARTICLE WHICH HAS BEEN VIOLATED IN EACH CASE. *Satisfactory performance will be no less than 4 of 5 articles selected correctly within 20 minutes per scenario.*

Analysis: This criterion objective describes a fairly high level task. Much is assumed about the difficulty and complexity of the scenarios, but it is probably not reasonable to attempt much more descriptive information here. Whatever the degree of difficulty, both the instruction and the testing should be essentially the same. "Correctly" in the standard makes two assumptions: that one or more experts in the field have determined what is correct and that the student must come up with an answer which is consistent with that of the experts. Although very simple examples could be identified at the comprehension level, violations of the UCMJ are generally so complicated that it is more likely that they would require understanding at the application level.

Legend: Conditions, PERFORMANCE, *Standards*

Figure 5-12

Criterion Objective

Type of Testing: Paper and pencil

Level of Learning Objective: Synthesize appropriate concepts and principles of effective instructional development in the planning, preparing, delivering, and evaluating of learning experiences.

Sample of Behavior: Prepare a demonstration-performance lesson plan.

Criterion Objective: Using a personally selected topic and without restrictions on reference materials or lesson planning formats, PREPARE A DEMONSTRATION-PERFORMANCE LESSON PLAN *which contains*

1. *a criterion objective with all required elements,*
2. *a criterion-referenced test item which validly determines mastery of the criterion objective, and*
3. *a teaching plan generally consistent with accepted principles of learning and instructional design.*

Analysis: This criterion objective is broad in scope and at a quite high level of learning. Obviously, many pages of information are dealt with in the standards. It is probably unreasonable, however, to put much more information into the objective. The objective calls for several qualified value judgments ("generally consistent with" and "validly determines mastery"), but such judgments can be expected in an objective at this level. In this case, both judgments require the instructor to be an expert, and neither can be quantified easily.

Legend: Conditions, PERFORMANCE, *Standards*

2. Omitting significant items of information. Significance obviously involves a value judgment. Something that is significant to one instructor about a testing situation may not be significant to another. Here, again, the real measure is what will affect the performance of our students. We may assume that our students understand that they may refer to their notes, look up words in a dictionary, or ask questions. But do they know this information far enough ahead of time to prepare for their exams adequately? They will, only if we have included all the significant items of information in our condition statement.

3. Including information of little or no significance. Some condition statements look like an inventory from a weekend shopping trip to a variety store. Everything imaginable is listed but the kitchen sink. Unfortunately, this long, meaningless inventory is often included and important information left out.

One example of this error involved a course designed to teach mid-level supervisors how to manage effectively. The primary methods were case study and guided discussion. The criterion objectives written from the samples of behavior were so poorly written that they destroyed the credibility of the instructor. While completely overlooking the significant conditions for evaluation (such as simulated management problems in case form), the writer was very careful to mention in the criterion objective that the students would be "given paper and ball point pen." We can hardly argue against paper and ball point pen, but that bit of information could certainly be assumed without much effect on the objective. The information that was left out was significant and did have an effect on students. Other routine environmental factors (such as light, air, tables, and chairs) need not be listed unless there is some concern that they might not normally be available.

4. Talking around the genuine conditions. Some writers of objectives seem to have trouble telling their students what to expect in terms of the conditions for testing. Often it is not a lack of writing skill or subject expertise. These instructors still have difficulty accepting the idea that they should be as open with their students as suggested here. For years many of us have succeeded in keeping our students in constant suspense about what they were required to learn. Many instructors who have really developed these skills of deception have been able to transfer them to writing criterion objectives.

Often such expressions as "given necessary supplies and materials" or "given any management situation" are used to hide a more understandable statement. Does "given the materials" mean that they will all be preselected and laid out for the students? Or do they have to make some decisions about which materials or supplies are appropriate? Does "any management situation" really mean "any"? Or is there actually a very limited set of situations which could be described more precisely?

5. Describing the mechanics rather than conditions. Particularly in an academic setting, it is often easier to describe the mechanics of test administration than conditions affecting student performance. A condition statement like "given a test with 30 items about . . ." misses the whole idea of the criterion objective. Such a statement is probably inappropriate unless the test is measuring a single criterion objective which

requires 30 common items. Those who fall victim to this attractive short cut tend to write worthless condition statements. The temptation is to view paper and pencil tests containing several items as a single learner performance. It is possible that a written test of many items may measure a single criterion objective, but this is not usually the case.

Most paper and pencil tests measure more than one criterion objective: test items 1-5 on a particular exam may measure criterion Objective #1: items 6, 8, 10, 12, and 14 may measure objective #2; and so on. A paper and pencil test which measures several objectives generally does not need another overall criterion objective. Chapter 24 disucsses one exception where the instructor has grouped indiviual criterion objectives together in a package and established an overall passing criterion. When asked what objectives a test is measuring, we should be able to point to the criterion objectives being measured by the various items within the test. In our operating instructions, we may wish to specify the minimum number of objectives required to pass the course rather than some overall test score or percentage for the exam.

The word picture created by describing the conditions should be clear and complete. Our students, another instructor, or any other reasonable person should be able to understand and recreate, if necessary, the testing environment in which we intend to measure student learning.

Performance

The performance portion of the criterion objective tells us what the student will be doing (or will have done) to prove learning. The description of behavior is most easily communicated by using an action verb and a clear description of the object of that action.

The Action Verb

There is no mysterious list of "magic" or forbidden words to learn. Generally speaking, active verbs which describe observable, measurable student behavior are best. The criterion objectives illustrated in this chapter contain several acceptable verbs for describing student behavior. As can be seen from these examples from performance testing and paper and pencil testing, the verb gives a good indication of what the student will do. But verbs that describe an internal state of mind (know, comprehend, etc.), while acceptable to indicate the level of learning, will not give us the information we need to write a criterion objective. Figure 5-13 presents a sampling of verbs which are generally felt to be acceptable and unacceptable for writing criterion objectives.

Some descriptions of student behavior do not fall clearly into either performance testing or pencil and paper testing. In those cases, we must decide whether the total objective and the level of learning clarify the performance statement. If not, we may have to tighten up the performance description further to communicate our real intent. This ambiguity is rarely an issue for overt, physical tasks, but it often enters the picture when the behavior is incidental, rather than critical, to the objective--as is the case in most pencil and paper testing. For instance, does the verb "write [illegible] a criterion objective communicate a critical physical act, or is it incidental to the act of "editing," "composing," or "solving"? Figure 5-13 illustrates several verbs which may fall into either the critical and non-critical categories.

Verb Descriptors of Student Performance
(Criterion Objectives)

Acceptable Verbs (observable and measurable)

- shoot
- define
- describe
- splice
- fasten
- turn
- edit
- assemble
- drive
- remove
- load
- speak

Unacceptable Verbs (going on inside the learner)

- know
- comprehend
- apply
- analyze
- synthesize
- evaluate
- understand
- appreciate
- be familiar

May be acceptable depending on context (affected by writer preferences, rules of the school, need for extreme precision, etc.)

Acceptable Verbs	Better if specific behavior is critical
list	list in writing
solve	write solution
critique	verbally critique
summarize	write a summary
identify	identify by circling
name	name orally and in writing

Figure 5-13

When we write the performance information, it may help to visualize the actual measurement situation. What will we actually see? What will really be evaluated? Will we watch the student actually perform the task? Or will we collect some product produced by the student (written paper, multiple choice exam, or a properly folded flag)?

Object of the action:

An observable, measurable action verb gives half of the information required in the performance description. The object of the action verb is the other half of the required information. This part of the performance statement is usually not emphasized as much as the action verb, but it is of great importance. Note that in the sample criterion objectives, Figures 5-3 through 5-12, the object of the performance is clearly stated and included as a part of the performance statement.

Objectives frequently indicate that a student will be able to write a "thing" or repair a "thing" or critique a "thing." Often the "thing" in the performance statement is taken for granted and given little attention. The object of the action of the verb should be precisely stated. Here, again, reasonableness can be a problem. Is the military letter (the object of the verb "write") the real target of performance? Or is the target really "any written communication" with the military letter just a convenient device for testing? In addition, does the object named have a generally accepted definition? Or is a definition or description necessary? Is the jargon or technical language used in the objective shared by our readers?

Common Errors

Of the 3 criterion objective elements, the performance description should be the least difficult to write. There are, however, a few common errors to be anticipated and avoided:

1. Substituting Levels of learning for action verbs. Writing objectives for specific levels of learning was introduced in Chapters 2 and 3. Chapter 4 explains the approach to planning level of learning objectives in depth. These levels or categories of learning serve a valuable function by grouping equivalent student behaviors for sampling. They are not meant to be substituted, nor can they be substituted, for the action verb in a criterion objective. Any attempt to replace the criterion objective action verbs with verbs from the levels of learning (know, comprehend, etc.) will produce a criterion objective which is unsatisfactory.

2. Using vague or general action verbs when specific verbs communicate better. It may seem that the choosing between good (specific) and poor (vague and general) verbs is quite simple. Some verbs may seem to be better than they are at first glance. Verbs such as demonstrate, operate, or prepare may leave important unanswered questions. To demonstrate--by doing what? To operate--which operations? To prepare--which tasks of preparation? It is possible to use such verbs in well-written objectives. However, they have to be seen in context and evaluated on their ability to communicate clearly.

3. Overly generalized or poorly defined object of performance. A verb may clearly describe the desired learner behavior, but the object of that behavior can be poorly stated. Often such terms as any and all in a performance statement do not mean "any" or "all." Generally, we find some limit on the type of problem or kind of object being acted on. It is unlikely that a student in a leadership school can solve all management problems. It is just as unlikely that a technical student could make all repairs on any object. The scope of the performance may be limited in the performance statement or in the condition statement. It does not matter which item does the limiting so long as the limits are communicated.

The performance section of the criterion objective must contain an action verb (do what?) and an object (to what?). Along with the condition statement, the performance description describes everything of significance that will occur during the test or measurement situation. All that remains is for us to tell our students the criteria or standards to be used to evaluate their performance.

Standards

The standards for criterion objectives are often difficult to write. Many difficulties show up quickly as we try to express standards to students so that they can be understood. Some of our problems can be traced to the limits of written language, others to a lack of conscious awareness of our own standards, and still others to philosophical problems many of us have with revealing our standards to students.

Many standards are difficult to express in words. Standards describe how well students must do a task to be acceptable. Often language lets us down. How smooth should a "smooth" finish be? When is a description of an object or event "complete"? How clear is a "clear" explanation? This problem with language cannot be completely overcome. A careful, honest attempt to describe standards, along with trial and error, is the best we can hope for. The creative use of models and other media to supplement our word pictures may be helpful. We must realize, however, that the perfect (satisfying to all readers) set of standards for a complex criterion objective is probably yet to be written, particularly for qualitative standards. This problem may be best summarized by the instructor who says, "I know a passing effort when I see one, but I just can't express it in the right words."

Some standards, particularly quantitative, should be easy to express because they lend themselves to precise terms. Often, however, even these standards are poorly written and incomplete because of an instructor's inability to verbalize all of the standards which will be used to evaluate student performance. When there are many standards for an objective, there is a temptation to list those which are most obvious and easiest to express and measure. The student is put at a great disadvantage, however, when additional unstated standards are used to determine satisfactory performance. Instructors often apply unstated time standards and assumed quality standards to student work. No standard should be used to evaluate student performance which is not written into the criterion objective or reasonably assumed. If a student can meet all of the criteria in the criterion objective but the performance is still unsatisfactory, we should reevaluate the objective for additional standards.

A third and more fundamental reason for poor statements of standards is negative instructor attitude about revealing standards. In spite of the Air Force commitment to Instructional System Development (ISD) and instructional objectives, many instructors feel that there is something wrong with telling students exactly what is expected of them. Most of us are products of traditional schools which were not "systems" oriented. Few of us have had more than a course or two, in or out of the Air Force, where objectives were carefully spelled out. As successful students in those traditional schools, some instructors question ISD in general and criterion objectives in particular.

If instructors cannot see the benefits of this approach in terms of more relevant course content, as well as more effective, efficient instructional techniques, they might have trouble expressing their own objectives. Some would say, "I never had anyone spell the course out for me like that. Why should I spoon-feed my students?" This weak argument against writing criterion objectives is best summarized by an instructor who was overheard saying, "I'm not going to write criterion objectives. Why, if I tell my students exactly what they have to do and how well they have to do it, they may all get it right!"

Types of Standards

Many different types of standards may be used to evaluate student performance.

The following list of the most commonly used standards is an expanded and modified version of that available in AFP 50-58, Volume III.

1. Referring to an external authority. Time and space may be saved by making reference to an external authority in criterion objectives. Authors of source material often state qualitative and quantitative standards very well, and rephrasing may be a waste of time and no improvement. Reference to specific regulations, manuals, authors, checklists, or rating scales is appropriate and should be encouraged. Figures 5-3, 5-4, 5-6, 5-7, 5-8, and 5-9 illustrate ways in which external authority may be referenced.

2. Expressing or implying a percentage or ratio. We frequently see a percentage or ratio in criterion objectives, as when a student must solve 80 percent of a set of problems or locate a malfunction in 2 of 3 cases. Where this type of standard is appropriate, it is easy to state and easy to measure. Figures 5-5, 5-9, 5-10, and 5-11 illustrate percentage or ratio standards.

We often find it natural to write a standard which says "with 100 percent accuracy" or "without error." If there is any doubt that the reader would not assume this standard, we ought to include it. But we may find the phrases become very repetitious. Often, we can assume the standard of "no error" in our objectives without spelling it out as long as our students understand what we mean. Figures 5-3, 5-6, and 5-8 spell out the standard of "no error." Other objectives, such as Figures 5-7 and 5-12 assume the "no error" standard, and a percentage or ratio is not stated.

3. Specifying repetition or redundancy of testing. Standards which express a percentage or "no error" usually indicate a one-time test. That is, if the student does something without error once or locates 2 or 3 malfunctions one time, the objective has been met. If this is what we intend, then we have said all we need to. But we may want the student to show mastery of the objective more than once to prove that learning has occurred. In those cases, to a standard such as 75 percent in Figure 5-5 or without error as in Figure 5-8, we would add another statement to the standard, such as "in two consecutive tests" or "in 2 of 3 examinations separated by at least two weeks." We may even wish to extend our test/retest period beyond graduation and use the retest as part of the graduate follow-up program.

4. Specifying physical measurements and tolerances. Many types of physical measurements will appear in criterion objectives, such as tolerances, weight, number of words, pounds of pressure, distance, degrees, and rate. We should use these standards, which are generally easy to express, whenever appropriate. We find an example of this type of physical measurement in Figure 5-7 in the rate of flow of the intravenous solution.

5. Specifying the time requirements. We should express time, as a standard, whenever it may affect student performance. If time is not included as a standard, we assume that a reasonable period of time will be allowed for the testing of performance. A "reasonable" period allows any learner who has mastered the skill to complete the task without running out of time. If we plan to time the test or measurement in any way, we normally include time as a standard in the criterion objective. In paper and pencil testing, we may or may not include time for each

objective being tested. In any case, the total time for the test should be the sum of times estimated for each of the objectives being tested. Figures 5-5 and 5-11 illustrate the use of testing time as a specific standard. "Reasonable time" is an assumed standard in the other examples.

6. Specifying the rate of production. Many performance skills are measured in rate of production. This measure should be included in appropriate objectives. Skill development situations which might use this standard include key punching, typing, shorthand, and production bench work. The typing problem described in Figure 5-6 could be modified to include production rate as a standard by adding "at a rate of 12 forms per hour."

7. Specifying qualitative requirements. Many of the most significant standards applied to student performance are qualitative and may require judgments involving sight, sound, taste, and other inexact measures. To the extent that we can legitimately quantify standards, we should do so. If there is a color or smoothness scale, we should use it. If there is a format for a written course requirement, we should refer to it. If a "properly supported" argument means, among other things, at least three acceptable statistics or examples, we should include that in the objective.

But often no such external standard exists, and qualitative standards are often genuinely difficult to express. If there is no reasonable way to define the qualitative standard objectively (e.g., run smoothly; fold neatly; develop fully), we use the qualitative term. We must keep in mind, however, that the qualitative term may not be interpreted the way we mean it. All of the criterion objectives in this chapter contain one form or another of a qualitative standard, but particularly standard 2, Figure 5-3, and standards 2 and 5, Figure 5-7.

8. Specifying degrees of supervision or assistance. The degree of supervision or assistance provided during a test may affect the quality of the results. Students require a much higher degree of skill and need a greater depth of understanding to perform a task without supervision or assistance. If we do not specify a level of supervision or assistance, it is assumed that the student must perform without supervision and without assistance. Figure 5-7 illustrates a specific assistance standard. The other examples may be interpreted to read "without supervision and without assistance."

Common Errors

A wide range of difficulties may be encountered in writing standards for criterion objectives. There is no way, short of extensive experience, to identify all the possible problems we may encounter. The information which follows, however, deals with many of the more common errors and should help to write better objectives.

1. Overestimating the value of an external authority (regulation, pamphlet, rating scale). Information actually contained in the cited authority may not be precise enough or complete enough to use for student evaluation. The authority cited may include information which is unacceptable or inappropriate for the learning situation. In many cases, since these documents were not

written to be used as a part of a criterion objective, they are written in generalities which are not easily understood or measured.

2. Inappropriate or inexact percentage or ratio. Few standards are as easy to express and measure as percentages. Unfortunately, we can be tempted to use exact percentages when other, more difficult criteria are appropriate. Instructors often mistakenly use percentages because of past practice rather than a careful analysis of real criteria. Often we will express or imply a standard of 100% accuracy when it is unwarranted and unrealistic. We can easily fail to take into account such factors as fatigue or simple errors in math, in cases where performance less than 100% is acceptable for mastery.

3. Assuming retention based upon a single evaluation. If retention is important, we need to program reasonable retesting into our learning situations. Students should be told that they are going to be tested on the same objective more than once (e.g., query, block exam, and phase exam).

4. Understating or oversimplifying measurements. Some instructors write standards for criterion objectives to the lowest acceptable level of performance. Such a standard may be invalid if performance on the task is generally expected to be higher than the bare minimum. We may have many reasons for setting classroom standards higher than the lowest acceptable level of performance on the job. Additionally, we may make the mistake of using convenient, easily measured standards when other more difficult standards to express are more appropriate.

5. Overlooking time as a factor in testing. Many criterion objectives are written without reference to time, but time constraints are imposed upon students during testing. When time standards are set, they are often guessed at and not verified to determine their reasonableness.

6. Incomplete or inaccurate production rates. The per minute or per hour production rate is often an important standard. Additionally, however, it is often important to specify the period over which the per minute or per hour standard is to be maintained. There is a big difference in typing 60 words a minute for a single minute rather than for 10 minutes. We may also make an error in the actual unit of production being measured. It may be more appropriate to measure business letters typed or 80 column cards keypunched than words typed or punched per minute.

7. Poorly stated quality standards. Quality standards are generally difficult to write as compared to measures of quantity. Often, however, we excuse poorly written standards simply because they contain quality standards. We should avoid such expressions as "to the satisfaction of the instructor" or "until the work is acceptable." In these cases, the instructor has succeeded in keeping the real standards from the students. Students often have no idea what "satisfaction of the instructor" or "acceptable" may mean.

8. Failing to account for supervision or assistance. We may assume that students will perform a task without supervision or assistance but omit that information from the criterion objective. When students don't realize they must perform without supervision, we may be forced to provide additional instruction during the exam, answer questions, or

inadvertently correct obvious errors as they are being made.

Preliminary Planning

This manual introduced taxonomies of learning in Chapter 2 and covers them extensively in Chapters 4 and 10. As indicated in Chapter 5, we should use some classification scheme to plan and write criterion objectives. The cognitive (knowledge and understanding) and affective (attitudes) taxonomies presented in this manual, the taxonomy from AFM 50-2, and the ATC proficiency codes are among the systems used to classify and rank order learning and can help us write better objectives. These taxonomies and others can serve as models against which we can check the level of learning of criterion objectives. The behavioral verb which describes the performance of the learner, particularly in academic courses, is often not adequate to guarantee that learning is at the level we desire. Instructors may misinterpret well written objectives if they have no general idea of the level of understanding which the performance represents. Instructors may try to teach from criterion objectives and focus in too narrowly on the behavior rather than developing real understanding. It is easy to confuse the understanding of a concept with a single behavior which may be just one indicator of understanding. When we attempt to teach from "canned" lesson plans, for instance, we often have trouble interpreting the lesson writer's real intent. In such a case, it is tempting to train for the behavior rather than develop the learning represented by the behavior.

Using taxonomies or proficiency codes is also valuable in providing a common denominator to construct alternate test forms. This technique may be very important when we cannot test all of our students at one time and need to control the tendency of students to pass answers from class to succeeding class.

Sometimes we actually publish the taxonomy information (as we generally do in professional military education and with the Air Training Command proficiency codes in technical courses). Sometimes we use it only as a planning step. In either case, the step where we make a decision about a level of learning is extremely important for producing well written, meaningful criterion objectives. Refer back to Chapter 4 to review the discussion of the use of the cognitive taxonomy as a planning step for academic lesson planning.

Task Steps as Planning Tools

Criterion objectives give a great deal of information about what a student should be able to perform after instruction. But criterion objectives do not tell us how we are going to get our students from where they are to where we want them to be. An effective technique for planning our instructional strategy is to break down the criterion objective into its component task steps and arrange sequential learning experiences. For planning purposes, task steps are expressed behaviorally but are usually written without conditions or standards (as with criterion objectives). If we are individualizing or self-pacing instruction, we may wish to write out task steps as criterion objectives. But generally statements such as the following are typical of most published task steps:

- write criterion objective
- list management styles
- insert module into circuit board
- explain concept of detente
- develop lesson plan
- position, load, and advance magnetic tape

Task steps are the sub-skills or understandings that must be accomplished in order to achieve the criterion objective. There are several texts (including AFP 50-58, Volume II) that deal more fully with the subject matter of tasks, task analysis, and sequencing of instruction. However, the following brief explanation may be sufficient.

Analysis of a criterion objective into a relatively simple sequence of task steps might look like Figure 5-14.

TASK ANALYSIS OF CRITERION OBJECTIVE

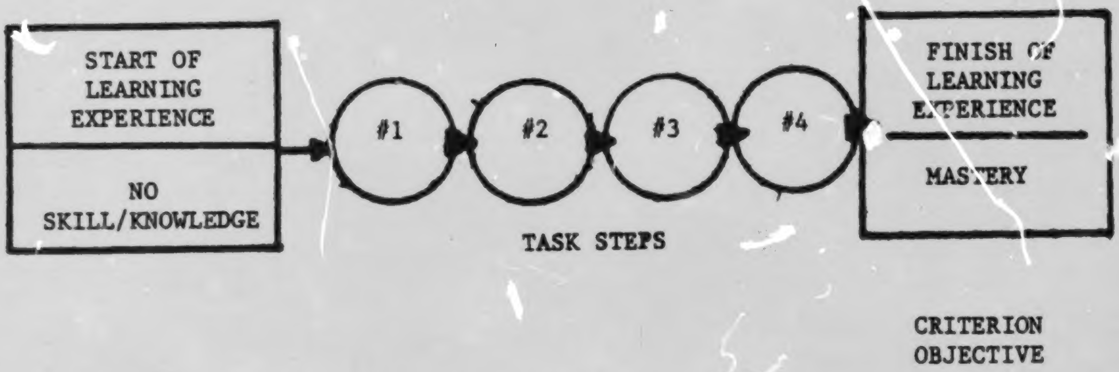

START OF LEARNING EXPERIENCE
NO SKILL/KNOWLEDGE
#1
#2
#3
#4
TASK STEPS
FINISH OF LEARNING EXPERIENCE
MASTERY
CRITERION OBJECTIVE

Figure 5-14

In this illustration, a student who starts with no skill must learn to perform four sub-skills or gain four items of supporting knowledge in order to show mastery of the objective. An analysis of this type is useful to make sure that all significant task steps and the necessary background are accounted for in planning the course or lesson. A listing of these steps in order will provide a checklist if we wish to evaluate our students as they progress independently.

Although the task steps must be performed in a 1-2-3-4 sequence, our students may not need to learn them in that order. We may not have a work station for each student, for instance, or some students may already possess one or more of the sub-skills. Figure 5-15 illustrates two of the possible instructional designs that might result from such an analysis of a criterion objective.

ANALYSIS OF INSTRUCTIONAL SEQUENCE

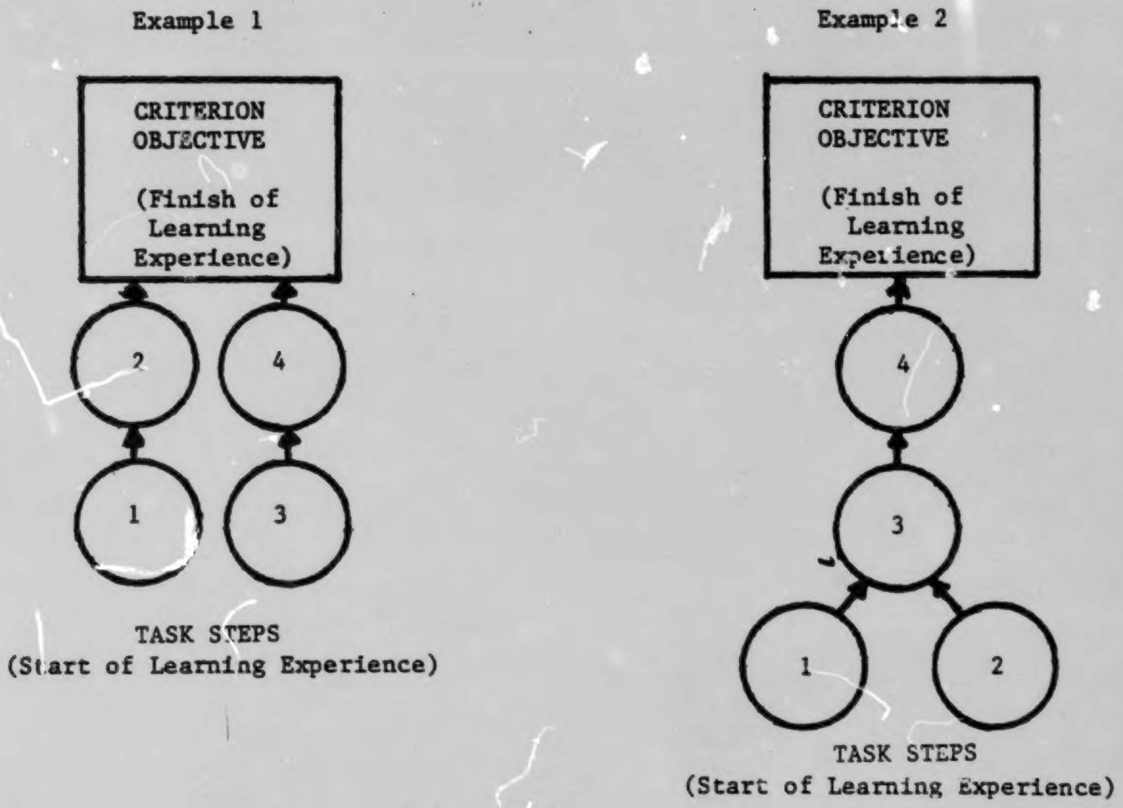

Example 1
CRITERION OBJECTIVE
(Finish of Learning Experience)
2
4
1
3
TASK STEPS
(Start of Learning Experience)
Example 2
CRITERION OBJECTIVE
(Finish of Learning Experience)
4
3
1
2
TASK STEPS
(Start of Learning Experience)

Figure 5-15

This criterion objective represents the same learning outcome illustrated in Figure 5-14. In that figure, however, we were illustrating a sequence in which all of the task steps had to be performed in sequence to demonstrate mastery in the skill described in the criterion objective. Figure 5-15 shows two of several possible sequences in which the students might learn the skill. The skill and the component steps are imaginary, but the diagrams can be used to make the desired point. In Figure 5-15, the analysis of the skill has revealed that task step 1 must be learned before task step 2 can be learned. Also, task step 3 must be learned before task step 4. But we have also discovered that task steps 3 and 4 are not dependent upon learning to perform task steps 1 and 2. Such a situation might exist when task step 1 is "measuring," task step 2 is "computing," and task steps 3 and 4 are "sawing" and "fastening." Example 2 represents another analysis in which the performance of task steps 3 and 4 are dependent upon learning the first two task steps, but the order in which students learn the first two task steps is not significant.

These illustrations are quite simple, but the analysis of more complex skills may look like the electrical wiring diagram of a color television set. Refer to AFM 50-58, Volume II, and other instructional design texts for more comprehensive and detailed explanations of this procedure. The value of this type of analysis is twofold:

1. We can account for all component tasks and spell them out in detail.

2. As we discover which skills are dependent upon other skills in the learning process, we become aware of appropriate strategies for instruction.

Summary

The criterion objective is an effective way to communicate precise outcomes of learning. Each criterion objective describes the proof that an instructor will accept that a learning outcome has been mastered.

While many formats for writing criterion objectives may be used, they all require three basic items of information: performance, conditions, and standards. The checklist (Figure 5-16) which is included as a part of this summary will help us write criterion objectives with all the required elements. Criterion objectives provide the basis for tests which measure student performance for comparison with an objective standard.

In spite of a tendency for beginning writers to make fairly predictable errors and to oversimplify the learning process, criterion objectives have changed the face of instructional programs. Criterion objectives are invaluable to the technical instructor for specifying exact, optimal levels of training. They are also of value to the academic instructor to establish the base line of instruction or minimum objectives upon which more open-ended courses such as professional military education are developed. Criterion objectives also help us to consider the environment for testing as well as the standards for evaluation so that we can deal fairly with our students. In addition, criterion objectives help us to visualize our test items better so we can make valid and reliable measures of student achievement.

CRITERION OBJECTIVES WRITER'S CHECKLIST

Conditions:

1. Are there any physical factors (such as, materials, equipment, supplies or references) in the performance situation which should be noted as being present or specifically excluded?

   No ( ) Yes ( ) If yes, specify:

2. Is there any problem or situation which will confront students to which they must respond?

   No ( ) Yes ( ) If yes, specify:

Performance:

1. What will students be required to do? Specify with an action verb:
2. To what? Specify:

Standards:

Which of the following standards will be used to evaluate student performance?

( ) 1. External authority. Specify:

( ) 2. Percentage or ratio.

  ( ) Without error/100% correct.

  ( ) Other. Specify:

( ) 3. Requirement to be tested more than once. Specify:

( ) 4. Physical measurements and tolerances. Specify:

( ) 5. Time limitation. Specify:

( ) 6. Production rate. Specify:

( ) 7. Qualitative standards. Specify:

( ) 8. Degree of supervision. Specify:

Figure 5-16

Chapter 6

DEVELOPING THE LESSON PLAN

A lesson plan is a plan for learning. As is true in most activities, the quality of planning affects the quality of results. Successful executives and professional people know that the price of excellence is careful preparation. A lawyer spends hours planning a case before appearing in court. A minister does not ad-lib a sermon but plans days or weeks in advance. In anticipation of the big game, the coach spends hours planning the plays and watching the team execute them. Should we attempt such a complicated process as learning with less attention than is given to other important activities? The answer is obvious: of course not. The effective instructor devotes much time and energy in carefully planning and preparing each lesson, whether the lesson encompasses one or several periods of instruction.

To ensure the greatest probability of learning, we must carefully select and arrange activities that will produce the desired learning outcomes in our students. Only through careful planning can we be certain that we include all necessary information and have our lesson plan properly organized to achieve the lesson objective. The complete cycle of lesson planning includes eight steps:

1. Determine the objective.

2. Research the topic as defined by the objective.

3. Select the appropriate instructional method.

4. Identify a useable lesson planning format.

5. Decide how to organize the lesson.

6. Choose appropriate support material.

7. Prepare the beginning and ending of the lesson.

8. Prepare a final outline.

DETERMINING THE OBJECTIVE

Often we will begin our lesson planning with an objective or objectives clearly in mind. At other times the objective may be shaped by the research and additional planning we do. In other words, although the first step of the lesson planning process is to determine the objective, our objective may not fully evolve until after we have completed other steps of the process.

Objectives need to be student-centered. We should not state them in terms of what we want to teach, but rather they should be stated in terms of what we want our students to learn. For instance, the objective of a lesson on developing a lesson plan might be for each student to know the eight steps of effective lesson planning as listed in this chapter. Of course the lesson might be taught at higher than the knowledge level. We might want each student to comprehend the eight steps appropriate to effective lesson planning or even to be able to apply the eight steps of lesson planning. But whatever the level, the student-centered objective should guide our subsequent planning. Without a clear objective, we won't know if we ever get there. Think about that statement.

RESEARCHING THE TOPIC

After we have written or been provided with an instructional objective, we are ready to decide on the main points of the lesson and gather materials about the lesson topic. Normally we do not collect a mass of research materials and then develop an objective to match the findings. Not only is this latter approach inefficient, but it is also likely to be ineffective. It may well ignore the specific needs of the students and the Air Force. The objective should determine the research that needs to be done. On the other hand, research may justify a decision to modify an objective or rearrange main points for greater accuracy or clarity.

Usefulness and appropriateness are two important criteria for selecting relevant material. To be appropriate, information should relate to the lesson objective and have a high possibility for student retention. To be useful, it should aid both the instructor and the students in the teaching-learning process. If the instructor selects material solely on the basis of its interest value, a lesson may be filled with interesting information of little learning value to the student. On the other hand, dry, uninteresting facts--even though they are very important--may also defeat the instructor's purpose. Students are more likely to grasp and retain facts and concepts that are enriched with interesting support material and arranged in a way that enhances learning.

With the objective clearly in mind, we are now ready to gather actual material or do research on the subject. The sources for this material are our own experiences, the experience of others which we gain through conversation and interviews, and written or observed material. Instructors concerned with teaching a good lesson will often draw from all of these sources.

Self

The first step in researching a lesson topic is to see what we ourselves know about the subject. Our personal knowledge may suggest a tentative organization, but more important, it will point up gaps in our knowledge where we need further research.

Others

The second step in the research process is to draw on the experience of others. People who are interested in the topic may provide ideas during the course of conversation. The most fruitful source is the expert who may help us clarify our thinking, provide facts and testimony, and suggest sources for further research.

While personal experience, conversation, and interviews provide valuable content for lessons, we must usually do further research elsewhere. If we have properly narrowed our subject and kept the purpose in mind, our research task will be easier.

Library

Modern libraries provide us with an abundance of sources: books, newspapers, popular magazines, scholarly journals, abstracts, subject files, and microfilms. Quantity is no problem; quality is more difficult. We must always concern ourselves with the accuracy and relevance of the material we select. Using an article from 1950 to discuss atomic physics today might well lead to inaccurate, irrelevant conclusions.

The next step in the research process is to evaluate the material gathered. We will probably find that we have enough material for several lessons. We must now combine some ideas, eliminate others, and perhaps expand on what we found in the research materials. We will also want to give special attention to the types of support material we have selected (definitions, examples, comparisons, statistics, and testimony). Later in this chapter we will discuss types of support material in detail.

Sometimes we have an organizational pattern in mind before we start. If not, as we gather our material, we will probably see that the ideas are beginning to form into some type of pattern. Later in this chapter, we will discuss ways of organizing the lesson.

During the research phase, the instructor is likely to find material that students should read to prepare for a given class session. If we keep this possibility in mind when we begin our research, we can prepare a suggested student reading list and save time in selecting student references. When deciding on supplementary reading for the students, we should choose interesting and informative materials that reinforce or support the lesson objectives.

SELECTING INSTRUCTIONAL METHODS

After deciding exactly what to teach, the instructor determines how best to teach it and what instructional method to use. When related to instruction, "method" refers to a combination of techniques or skills used by the instructor to engage students in meaningful learning experiences. A method is a broad approach to instruction--for example, the lecture method or the guided discussion method. A technique, on the other hand, is a specific concrete skill or procedure used in implementing a method--for example, the technique of using the chalkboard or of using an analogy as support material.

Chapter 12 provides an overview of several instructional methods available to Air Force instructors. Chapters 13-17 present a number of these methods in detail.

Philosophy Underlying Selection

We should choose a teaching method suited to the student's needs as a learner. In making the selection, we consider the ways that people learn: by doing, by discussing, by listening, by observing, by participating. We should select the instructional method that will most effectively guide students toward desired learning outcomes. Our role is to select the method and the techniques that will result in meaningful learning experiences.

The Selection Process

No one method is suitable for all teaching situations, because no single method is sufficiently flexible to meet the needs of students in every learning situation. Chapter 18 presents an expanded discussion of the factors to consider in the selection of teaching methods. In general, as we have seen, the nature of a learning outcome suggests the type of activity that will be most helpful to the students in achieving that outcome. If, for example, we want students to gain skill in performing a certain task, one of the activities should be practice in performing the task. If the desired outcome is knowledge, students should observe, listen, or read so that they can relate what they are learning to their own experience. If students must learn to apply a principle, the instructor should ask them to solve problems or perform tasks requiring an application of that principle.

The instructional approach we choose for one learning outcome may be different from the approaches that we select for other outcomes in the same lesson. Our primary concern is to plan and select the most appropriate approach for students to achieve each outcome.

LESSON PLANNING FORMAT

Good lesson planning is essential for any systematic approach to instruction. Although many instructors become discouraged by the time required for good lesson planning, a well written and properly used lesson plan can be a very worthwhile teaching aid. Experienced instructors use written lesson plans for a variety of purposes. They can be checkpoints to ensure well-planned learning experiences. They can serve as teaching guides during lessons and as references for other instructors who may teach for us in emergencies. They also serve as convenient records of an instructor's planning techniques and methods of teaching. One of the most practical functions of lesson plans is that they serve as step-by-step guides for instructors in developing teaching/learning activities.

Content and Form

Authorities differ about the content and form of lesson plans, and many commands and schools have developed their own formats to satisfy particular needs. On the whole, however, most authorities generally agree on the essential characteristics of a good lesson plan. Figure 6-1 lists these characteristics, as well as those items of information which they routinely include.

Figure 6-1

Recommended Content and Components of Lesson Plan

Major Components	Information/Materials to be Included
Part I: Cover Sheet	Course/Phase/Lesson Identification Instructor's name Method used

	Objective (with behavioral indicators of achievement) Main teaching points or task steps References consulted Instructional aids used Handouts needed
Part II: Lesson Development	Content outline Notes on delivery techniques Cues for use of visual aids Notetaking space for student inputs Comments on effectiveness of plan made after lesson is presented
Part III: *Evaluation	Test items Record of student performance on test items Statistical analysis Record of test item revisions
Part IV: *Related Materials	Handouts Homework assignments Reading assignments Supporting documents Actual instructional aids Class text

*Often physically separate from Parts I and II.

ORGANIZING THE LESSON

After we have researched the topic, selected the appropriate instructional method, and identified the lesson planning format to use, we must decide how to organize the lesson. Every lesson needs an introduction, body, and conclusion. In most instances the body of the lesson should be prepared before the introduction or conclusion. After we prepare the body or main part of the lesson, we will be in a better position to begin or conclude the lesson. The first consideration in planning the body is how to organize the main points, but organization of subpoints is also important. Arrangement of the main points and subpoints of a lesson will help both the instructor and the students--the instructor in teaching it and the students in learning. Most lessons, regardless of their length, divide nicely into from two to five main points.

The typical ways of organizing main or sub points of a lesson are by the patterns of time, space, problem/solution, cause/effect, pro/con, or topic. Furthermore, certain strategies can be used with each pattern from known to unknown, for instance, or from simple to complex. How does an instructor decide which patterns and strategies to use? The lesson material will often organize itself more easily with one pattern and strategy than with another. Let us consider how various patterns and strategies can be used to organize the main points of a lesson.

Time

Our vocabularies are filled with words which refer to time: now, tomorrow, yesterday, today, sooner, later, earlier, last week, a month from now, four years ago, next time. We work, play, sleep, and eat at certain times. Major events in our lives are organized by time: births, engagements, marriages, deaths. Time or the chronological pattern of lesson organization is a natural way of arranging events in the sequence of order in which they happened, or in giving directions in the order to be followed in carrying them out. This kind of organization is sometimes called sequential organization. Certain processes, procedures, or historical movements and developments can often be explained best with a time sequence pattern.

The medical technician presenting a lesson on mouth-to-mouth resuscitation would probably use the time order for the main points: (1) preliminary steps--proper body position, mouth open, tongue and jaw forward, (2) the mouth-to-mouth process, (3) caring for the patient once breathing resumes. Time order is also a logical approach to lessons dealing with such subjects as "How to Pack a Parachute," "Development of the F-15 Fighter," or "How to Prepare a Speech."

Furthermore, any lesson on a subject with several phases lends itself well to the time pattern. For example, given an objective for students to know the three planned phases of the Common Market (where phase one was to precede phase two, and phase two to precede phase three), a lesson might have these main points: (1) Phase one--a customs union where nations agreed to reduce duties, (2) Phase two--an economic union allowing laborers and goods to move freely across national borders, (3) Phase three--a political union with national representatives as members of a common parliament and using a common currency.

Of course, rather than looking forward in time from a given moment, the strategy might be to look backward from a point in time. In other words, the strategy might be to move from recent to earlier time rather than from early to late. Regardless of which strategy is used, the flow of the lesson and the transitions should make the chronological relationships between main points clear to the students.

Space

A spatial or geographical pattern is effective in describing relationships. When using this pattern, the lesson material is developed according to some directional strategy such as east to west or north to south. For instance, if an instructor were describing the domino theory of guerrilla infiltration, a good strategy would make the main points of the lesson correspond to the geographical locations of various nations.

With lessons about certain objects, the strategy might be to arrange the main points from top to bottom or bottom to top. A fire extinguisher might be described from top to bottom, an organizational chart from the highest ranks to the lowest in the organization, a library according to the services found on the first floor, then the second, and finally those on the third.

Sometimes, the strategy is to organize the lesson from the center to the outside. For example, the control panel in an airplane might be discussed by describing first those instruments in the center most often used, then by moving out toward the surrounding instruments which are used least often.

In all lessons arranged spatially, we need to introduce each aspect or main point according to some strategy. Just as with a lesson organized by time, the subject matter and the transitions should include elaboration and clarification of how the main points relate to one another. A simple listing of the various objects or places without elaboration as to how they are related may confuse the students and make the points harder to remember.

Cause/Effect

A cause/effect pattern of organization is used in a lesson where one set of conditions is given as a cause for another set. In such lessons we may use one of two basic strategies to arrange our main points. With a cause/effect strategy, we begin with a given set of conditions and show that these will produce or have already produced certain results or effects. With an effect/cause strategy, we take a certain set of conditions as the effects and allege that they resulted from certain causes.

The cause/effect strategy might be used in a lesson concerning the increasing number of women in the Air Force. The lesson might first discuss the fact that women are now assuming more responsible leadership roles in the Air Force. One effect of women assuming such roles might be that women are joining the Air Force with increasing frequency.

The effect/cause strategy might be used in a lesson on child abuse. The first point might explain the effects of child abuse upon the children themselves, the parents, and even on society. The second point might suggest that the causes are that parents themselves were abused as children or that they lack proper education on parenting.

Whichever strategy is used, two cautions must be observed: (1) Beware of false causes. Just because one event or circumstance precedes another does not mean that the former causes the latter. Many persons assume that "First A happened, and then B took place, so A must have caused B." (2) Beware of single causes. Few things result from a single cause. There may be several causes and they may not act independently. Their effect may be greater or less than the sum of their parts. Lack of safety features on automobiles does not by itself cause most highway accidents, but this cause plus careless driving and unsafe highways may in combination account for many highway accidents.

Problem/Solution

This pattern, sometimes called the disease/remedy pattern or the need/satisfaction pattern, presents students with a problem and then proposes a way to solve it. With this pattern we must show that a problem exists and then offer a corrective action that is (1) practical, (2) desirable, (3) capable of being put into action, and (4) able to relieve the problem. It must also be one that does not introduce new and worse evils of its own. For example, the issue of controlling nuclear weapons has long been debated. Those against control argue that erosion of national sovereignty from arms control is more dangerous than no control.

There are different strategies we might employ when using the problem/solution method. If the students are aware of the problem and the possible solutions, we might discuss the problem briefly, mention the possible solutions, and then spend more time in showing why one solution is better than others. For instance, our objective is for students to comprehend that solar energy is the best solution to the energy crisis. Our main points might be (1) the world is caught in the grip of an energy crisis, (2) several solutions are possible, and (3) solar energy is the best long-term solution.

If the students are not aware of the problem or need, we may describe in detail the exact nature of the problem. Sometimes when students become aware of the problem, the solution becomes evident, and little time is needed to develop the solution in the lesson. At other times we need to spend time developing both the problem and the solution.

Still another strategy is to alternate or stagger portions of the problem with portions of the solution. For example, the cost of a project may be seen as one problem, workability another, time to do the project as a third. Taking each in turn and providing solutions to cost, workability, and time as we present these aspects of the problem may be more satisfying to students than if we had discussed all of the problem and then its total solution.

Whatever strategy is used, with the problem/solution pattern students must become aware that a problem exists before a solution will be agreed upon.

Pro/Con

The pro/con pattern, sometimes called the for/against pattern or advantages/disadvantages pattern, is similar to a problem/solution pattern in that the lesson is usually planned so as to lead to a conclusion. A major difference, however, is that fairly even attention is usually directed toward both sides of an issue with a pro/con pattern.

There are various strategies to consider when using the pro/con pattern. One consideration is whether to present pro or con first. Another is whether to present both sides and let students draw their own conclusions or to present the material in such a way that students are led to accept the "school solution." For instance, with a lesson on the effects of jogging we have to decide whether to present the advantages or disadvantages first. Then we must decide whether to let students decide for themselves whether the advantages outweigh the disadvantages. Pro/con plus one is the label given to the organization used when we draw a final conclusion based on the two sides.

When deciding the specific strategy to use with the pro/con pattern and determining how much time to spend on each, the following guidelines may be helpful: (1) giving both sides fairly even emphasis is most effective when the weight of evidence is clearly on the favored side; (2) presenting both sides is more effective when students may be initially opposed to the school solution; (3) presenting only the favored side is most effective when students already favor the school solution or conclusion; (4) presenting the favored side last is generally more favorable to its acceptance, especially if the side not favored is not shown in too strong a light.

Topical

A topical division of the main points of a lesson involves determining categories of the subject or lesson objective. This type of categorizing or classifying often springs directly from the subject itself. For instance, a lesson about a typical college population might be divided into topical divisions of freshmen, sophomores, juniors, and seniors, with each class division serving as a main point. Housing might be discussed in terms of on-base and off-base housing. A lesson on the Minuteman Intercontinental Ballistic Missile might be arranged with the main points of warhead, guidance, and propulsion systems.

At times the material itself suggests certain strategies for ordering the main points. For instance, a lesson on levels of learning lesson planning would most likely begin with knowledge level planning as the first main point, since knowledge level lessons are generally simpler to understand. Then the lesson would move on through the hierarchy to comprehension, application, analysis, synthesis, and finally evaluation levels. In other words, our lesson would follow a simple to complex strategy in organizing the "topics" or levels of learning.

Other topically organized lessons might follow strategies of known to unknown, general to specific, or specific to general. The number of strategies for arranging topical main points is practically infinite. The important consideration, as with any pattern, is that we give thought to the strategy of arrangement in order to improve student understanding and learning.

Combining Patterns

If we use a single pattern to organize the main points, our lessons will make more sense. We will be able to remember more readily what the main points are when we teach the lesson. Even more important, students will be able to follow the lesson more easily and retain the material if we use a single, logical pattern of organization.

While we may choose a certain organizational pattern for the main points, we may decide to use different patterns for subpoints. Consider the following tentative outline of a lesson with an objective for students to know the importance of nonverbal factors of communication:

Nonverbal communication

- I. Performance factors
  - A. Upper body (head and face)
    - 1. Positive effects
    - 2. Negative effects
  - B. Middle body (arms, hands, torso)
    - 1. Positive effects
    - 2. Negative effects
  - C. Lower body (hips, legs, feet)
    - 1. Positive effects
    - 2. Negative effects
- II. Nonperformance factors
  - A. Objects
  - B. Space
    - 1. Personal or body
    - 2. Furniture arrangement
  - C. Time

Notice that the main points (I. Performance factors and II. Nonperformance factors) are arranged topically. The subpoints for main point I (upper, middle, and lower body) are organized spacially. A pro/con pattern is followed in discussing positive and negative effects from each body performance factor. The subpoints of main point II (objects, space, and time) are organized topically as are the two subpoints under space. The important thing to remember is that each set of main points or subpoints should follow a given pattern of organization. Our tentative outline reflects this fact.

Of course, it may be that none of the formal patterns of organization discussed in this chapter adequately fits our content. If this is the case, we must simply strive to organize our lesson in the way that will help present the information to our students in the most meaningful fashion. As we construct our tentative outline, we must do so with our students' needs in mind. But whatever pattern or strategy we choose, it should be a conscious and rational choice and we should be able to defend or explain it. Quite often, the experienced teacher revises the outline three or four times before being satisfied and finally putting it into final form on the lesson plan.

CHOOSING SUPPORT MATERIAL

A major factor determining development of the lesson outline is the kind of support material we decide to use. While the organization of ideas forms the basic structure of any lesson, almost all ideas need some form of clarification or proof if the student is to learn.

Most students find it difficult to understand unsupported ideas or assertions. Suppose, for instance, we tell our students that it is important to organize a speech or a lesson according to one of several patterns of presentation. We then tell them that the most common patterns are time, space, cause, problem/solution, pro/con, and topic. Most likely, we will not have provided enough information so that our students can actually use these patterns of organization. We must go on to explain each of these patterns, as has been done in the preceding section of this chapter.

The subject, the method, the ability of students, the size of the class, and similar factors will help determine the amount and kinds of support material we need. We may also want to use visual support. Chapter 19 discusses types of visual support materials. Some rules governing their use are also presented.

Verbal support is needed either (1) to clarify or explain our points or (2) to prove our assertions. Definitions, examples, and comparisons are used primarily for clarification support. Their use as proof is limited. Statistics and testimony of experts can be used either for clarification or proof. With lectures and other presentational methods the instructor actually furnishes the support. With methods involving student interaction, such as the guided discussion, instructors use questions to encourage support materials from the students. Chapter 11 discusses how to use questions effectively.

Definitions

Definitions are often needed to clarify or explain the meaning of a term, concept, or principle. But like so many words, the term definition can mean different things and function in different ways.

In some lessons we need to use words that are technical, complex, or strange to our students. With the increasing specialization of Air Force schools in both theoretical and applied subjects, the output of words races ahead of dictionaires. Words such as emphysema (medicine), taxonomy (education), détente (military strategy), or groupthink (group dynamics) might require literal definitions or restatement in simpler language.

At other times we need to define words that we frequently and loosely employ. Some words simply have different meanings for different people. Words such as democracy, equal rights, security needs, and loyalty can often be defined easily. For instance, disseminate can be defined very simply as "spread widely." At other times we might seek novel and memorable ways to define our terms. Pragmatism might be defined as "a fancy word to mean that the proof of the pudding is in the eating." Sometimes it takes a little longer to define fully what we mean by a certain term. A former POW might define the sacrifice of one prisoner for another:

> When you see an American prisoner giving up his meager ration of fish just so another American

> who is sick can have a little more to eat, that is sacrifice. Because when you don't have anything, and you give it up, or you have very little and you give it up, then you're hurting yourself, and that is true sacrifice. That's what I saw in the prison camp.

Definitions should be used to explain the meaning of acronyms, that is, words formed from initials. In the preceding paragraph, with some audiences it might have been necessary to explain that POW stands for prisoner of war. When discussing PME at AU, we might have to explain that PME at AU means professional military education that is taught at Air University. Furthermore, we might go on to mention that PME includes AWC, ACSC, SOS, and SNCOA--that is, the Air War College, the Air Command and Staff College, the Squadron Officer School, and the Senior Noncommissioned Officer Academy.

Finally, at times an entire lesson may be needed to define or otherwise introduce students to a new term, concept, or principle. For example, when talking about the meaning of communication as transaction, it would probably be insufficient simply to say that the transactional approach means to consider the total communication process and the interaction of the various parts of the process on each other. Other forms of support material such as examples and comparisons might be needed to define fully what we mean.

Examples

Any time students ask us to give a "for instance," they are asking for an example to clarify the point we are trying to make. Sometimes the examples we use may be reasonably long. At other times a short example is sufficient. In some cases short examples are similar to definitions. The earlier definition of "sacrifice" given by the former POW might also be considered a short example. The fact that some support materials might be classed either as definitions or examples should not be a major concern to us. As classroom instructors we are more interested in using effective support material than in classifying it.

Often short examples can be clustered together in order to help students gain a more complete understanding of the point. In a lesson on a barrier to effective communication, we might cluster examples of spoonerisms: "Is the bean dizzy?" (Is the dean busy?); "I'll have a coff of cuppee" (I'll have a cup of coffee); "A half-warmed fish within us" (A half-formed wish within us).

Several questions can be asked about examples used in lessons:

- Do they accurately represent the point?

- Will students clearly understand their meaning?

- Do they fit the content? (Avoid those that may confuse.)

- Do humorous ones add rather than detract from the lesson? (Chapter 13 presents some guidelines for using humor.)

- Do they come from personal experience or can other examples be personalized in such a way as to seem real?

- Can anything be gained from clustering more than 3 or 4 examples? (Usually not.)

- Do long ones take too much time? (At times affective or attention-getting value of long examples may justify their use.)

- Are they interesting?

The appropriate answers to these questions should be obvious.

Comparisons

Description often becomes more graphic when we place an unknown or little understood item beside a similar but better known item. We might want to compare things that are unlike or things that are very much alike.

Metaphors such as Winston Churchill's "iron curtain" or similes (using the words like or as, such as Robert Burns' "My love is like a red, red rose," or the saying "strong as an ox") are comparisons of things that are unlike in most ways. We often use comparisons of unlike things in lessons. For instance, we might say, "The flow of knowledge is like the relentless and uncompromising flow of a river after the spring thaw as it imposes on us the requirement that we not only adjust but anticipate the future." Or we might show that being a member of a branch in an Air Force organization is like living in a family where we have intimate contact with each other. We might carry the analogy or comparison further by pointing out that in a unit as in a family, members can protect, help, or irritate one another.

Although analogies which compare things that are unlike serve as an excellent means of clarification, they have limited utility as proof. If we wish to prove an assertion we must compare "like" things. Comparison of Russian air power with U.S. air power or a mayor and city council with a base commander and his staff are "like" comparisons. Arguing for a longer orientation session for students in one NCO academy because it has improved academic performance at another would be comparing "like" phenomena--in this case, two NCO academies.

Contrast is a special form of comparison. For instance, showing how Air Force training differs from civilian training or how today's standard of living differs from that of a generation ago clarifies and explains a point by showing contrast or differences.

Obviously, any kind of comparison may be very brief like those given here or they may be quite long. We need to decide what will work best in a given situation. But whether long or short, comparisons are a valuable and generally underused method of verbal support.

Testimony

Words and thoughts of others become particularly useful when we wish to add strong proof support for assertions or points that we make. None of us is expected to be an expert on all subjects; often we must rely on what others have said. At times we use the testimony of others simply to clarify or explain an idea; often it is intended to provide proof for a claim.

A lesson dealing with managerial effectiveness in an organization may have as one of its main points the importance of effective downward communication. In other words, we want to stress how important it is for supervisors to keep their subordinates informed. We might quote from a recent "Air Force Policy Letter For Commanders," which says, "Commanders and supervisors have an increased responsibility to keep Air Force military and civilian members informed." We might also report the findings from a recent study by the International Association of Business Communicators which show that "face-to-face communication, including group meetings and one-on-one dialogue, proved the most effective means of communicating with employees."

Sometimes, we will use direct quotations as we have done here. At other times we will paraphrase what another has said. Whatever the case, there are two questions we will want to ask about the sources of testimony we plan to use: (1) Are the sources competent--do they know what they are talking about? and (2) Can they be trusted--are they free from bias? We might also consider whether the testimony is relevant, clear, and interesting and whether quotations are longer than necessary.

Statistics

Statistics are probably the most misused and misunderstood type of verbal support. When properly collected and wisely used, statistics can help instructors clarify their ideas. Statistics are also the most powerful proof support we can use. Not all figures, however, are statistics; some are simply numbers. Statistics show relationships (largeness or smallness, increases or decreases) or summarize large collections of facts or data. When we choose statistics to use in our lessons, there are some questions we should ask.

1. Are the statistics recent? Figures concerning the cost of living in 1960 would have limited usefulness for today's family planning its budget. When selecting statistics to use in our lessons, we should be on guard if no date is given or if the statistics are outdated.

2. Do the statistics indicate what they purport to? A single test score may not be a true measure of a student's ability. Comparing the simple number of planes may not indicate the comparative strength of two countries' air forces.

3. Do the statistics cover a long enough time to be reliable? The results of how one class responded to a new curriculum change would be less meaningful than how three or four classes responded to the change.

4. If the statistics are drawn from a sample, does the sample accurately represent the group to which we are generalizing? Public opinion surveys and experimental

researchers are generally sensitive to the importance of obtaining a representative sample. Instructors also need to be sensitive to this need.

5. When statistics report differences, are the differences significant? Minor variations can often be attributed to chance. In other words, if we were to collect our statistics again, the results might differ.

6. When comparing things, are the same units of measure used to make the comparison? Failure in one course might have a different meaning from failure in another. If more students fail one course than another, we cannot necessarily conclude that the content of one course is more difficult. Perhaps the grading scale rather than the content was more difficult.

7. Do the statistics come from a reliable source? And is the source clearly indicated? It is more effective to state the source of the information than to say, "recent surveys show."

8. Are the statistics presented to their best advantage to aid student understanding? Could visual aids be used to present the statistics in graphic or tabular form for easier understanding? Have figures been rounded off where possible? Students are more likely to remember nearly $45,000 than $44,871.24. Is the number of statistics limited so that students are not overwhelmed by them? Could the significance of statistics be made more clear with meaningful comparisons? To say that World War II cost the United States 200 billion dollars would be more clearly perceived if the figures were converted to today's dollars or if they were compared to the cost of other wars using a standard measure.

BEGINNING AND ENDING THE LESSON

So far we have selected the verbal and visual material that best supports our lesson and made necessary changes in the original tentative outline. We are now ready to cast our lesson into a final content outline. Usually before we outline, however, we will want to consider how to begin and end the lesson. If the lesson is not the first in a block of instruction, we may have little to do in the way of beginning or introducing the lesson. If other lessons in the same block of instruction are to follow this lesson, we may not need an extensive conclusion. But especially if the lesson is to stand alone, we need to give some attention toward preparing an introduction and conclusion.

Introduction

The introduction to a lesson should serve several purposes: to establish a common ground between the instructor and students, to capture and hold attention, to outline the lesson and relate it to the overall course, to point out benefits to the student, and to lead the student into the lesson content. While humor may be appropriate, the introduction should be free of irrelevant stories, jokes, or incidents that distract from the lesson objective. It should not contain long or apologetic remarks that are likely to dampen student interest in the lesson. Educators often speak of three necessary elements in the introduction of a lesson: gain attention, motivate, and provide an overview of lesson material.

ATTENTION. To gain attention, the instructor may relate some incident that focuses on the subject and provides a background for the lesson. Another approach may be to make an unexpected or surprising statement or ask a question that relates the lesson to group needs. A rhetorical question (Have you ever...? or Can you imagine...?) may be effective. At other times, nothing more than a clear indication that the lesson has begun is sufficient. In all instances, the primary concern is to focus student attention on the subject.

MOTIVATION. The instructor should use the introduction to discuss specific reasons why the students need to learn whatever they are about to learn. In this motivational discussion, the instructor should make a personal appeal to students and reinforce their desire to learn. The appeal may relate the learning to career advancement or to some other need. But in every instance, the instructor should cite a specific application for student learning experiences. In many cases, the need for this lesson as a foundation for future lessons is strong motivation. This motivational appeal should continue throughout the lesson. If a brief mention of needs is made only in the introduction, the instructor is square-filling, not motivating.

OVERVIEW. For most instructional methods, the introduction should provide an overview of what is to be covered during the class period. An overview with a clear, concise presentation of the objective and key ideas serves as a road map for learning. Effective visual aids can be helpful at this point. A clear overview can contribute greatly to a lesson by removing doubts in the minds of the learners about where the lesson is going and how they are going to get there. Students can be told what will be covered or left out and why. They can be informed about how the ideas have been organized. Research shows that students understand better and retain more when they know what to expect. The purpose of the overview is to prepare students to listen to the body of the lesson.

Conclusion

The conclusion of a lesson may stick with the students longer than anything else said. For this reason, we should give much care to its preparation. But the conclusion is also important in its own right. The conclusion of most lessons should accomplish three things: summarize, remotivate, and provide closure.

FINAL SUMMARY. Short or interim knowledge level summaries may be appropriate at various places in a knowledge level lesson, for example, after each main point has been made. But final knowledge level summaries come after all main points of the lesson have been made. An effective knowledge level summary retraces the important elements of the lesson. As the term suggests, a final knowledge level summary reviews the main points in a concise manner. By reviewing the main points, it can aid students' retention of information and give them a chance to fill in missing information in their notes.

In lessons designed to reach a conclusion (principle), a comprehension level summary is desired as the final summary. Short or interim comprehension level summaries may come at the conclusion of main points. But the final comprehension level summary comes after all main points of the lesson have been made and serves as the first part of the lesson conclusion. The purpose of a comprehension level summary is to provide logical and consistent reasons which support or lead to the desired conclusion (lesson objective).

The comprehension level final summary may require several minutes. While containing a brief restatement of significant information, it requires an expansion of key items to establish relationships which lead to a generalization. The generalization is the instructional objective. New support material can be introduced when needed to establish the generalization.

REMOTIVATION. The purpose of the remotivation is to instill in students a desire to retain and use what they have learned. Effective instructors provide motivation throughout the lesson. But the remotivation step is the instructor's last chance to let students know why the information presented in the lesson is so important to the student as an individual. Perhaps it is important because it provides the groundwork for future lessons or because it will help do their jobs more effectively. But whatever the reasons given, they should be ones that appeal directly to the students and show the importance to them of what was learned.

CLOSURE. For many instructors the closure presents the most difficult challenge in planning a lesson. Students need to be released from active participation. In lectures they need to be released from listening. In interaction methods they need to know that it is time for their verbal participation to cease. Sometimes instructors at a loss how to close say, "Well that's about all I have to say," or "I guess I don't have anything else." This type of closure is not very satisfying. There are much more effective ways of closing. Sometimes vocal inflection can signal that the lesson is ending. Quotations, stories, or humorous incidents can also provide effective closure. Sometimes when the lesson is to be followed by others in the same block of instruction, we might say something such as, "Next time, then, we will continue with our discussion of.... Between now and then if you have any questions, come to my office and I'll see if I can answer them for you."

PREPARING THE FINAL OUTLINE

After we have researched the topic, selected an instructional method, identified the lesson planning format we will use, organized the lesson, chosen our support materials, and decided how to begin and end the lesson, we are ready to prepare our final content outline. We may, in fact, prepare two versions of the outline. One version will be very complete--almost in manuscript form--so we can return to it several weeks or months later when we have to teach the lesson again or when someone else must teach the lesson. Another version will be much briefer--perhaps only one page long, or written on cards so we can carry it with us to the classroom and teach from it. This brief outline may be thought of as a keyword outline with key words and phrases to remind us of main points, subpoints, support material we plan to use, questions we might ask, and the things we want to mention in the introduction and conclusion of the lesson.

Since this keyword outline is a basic minimum for most of us to take into the classroom with us, the following discussion focuses on its construction. The longer version of the outline will follow the same principles, but much more information will be included in the outline.

Preparing a Keyword Outline

DIVISION. The outline should be divided into three main parts: introduction, body, and conclusion. As discussed previously, the introduction will generally have three subparts: atention, motivation, and overview. The body will have the main points of the lesson as major subdivisions. The conclusion will have three subdivisions: final summary, remotivation, and closure.

SYMBOL SYSTEM. To show the relative importance of lesson materials in the body of the lesson, we use a number or letter symbol before each entry. A roman numeral may be used to designate main points, capital letters for subpoints, arabic numerals for sub-subpoints, lower case letters for sub-sub-subpoints, and so forth. Some rules of outlining to remember are

1. Only one symbol should be used per point or idea.

2. Subordinate points should be indented.

3. The principle of subpoints or subordination means that a point follows logically or supports the point above it.

SAMPLE KEYWORD OUTLINE

Earlier we considered how we might make a tentative outline for a lesson on nonverbal communication. Now let us consider how we might revise that outline to teach from in class. This outline has been prepared to use with the lecture method. The same outline could be revised slightly to use with a guided discussion or teaching interview method by simply replacing references to support material the instructor supplies with questions that would prompt students or an expert to supply appropriate support material.

NONVERBAL COMMUNICATION

INTRODUCTION

Att: "Actions speak louder than words." "Dinner jacket" example
Mot: Dr. Ray Birdwhistle--65% of message communicate nonverbally
    Importance--jobs, family, church, clubs
Ov: Chart listing main points and first level subpoints
    Define "performance factors" and "nonperformance factors"

BODY

I. Know performance factors of nonverbal communication
  A. Upper body--importance capitalized on by F.D.R.
    1. Head
      a. Theory of origin of head gesture.
      b. Cultural differences
    2. Eyes--very important
      a. Show interest in others--example of blind student
      b. Nonverbal feedback--cultural differences
      c. Increase credibility--describe U of Mo. studies
    3. Facial Expression
      a. Affect displays--read Charles Darwin quote on expression
      b. Affect recognition--use everyday examples
  B. Middle Body
    1. Arms--demonstrate how we use them
    2. Hands--primary means of gesturing
      a. Compare meanings from different cultures--OK and Victory signs
      b. Demonstrate use of hands
    3. Torso--demonstrate shoulder, chest, stomach--Belly dancer example
  C. Lower body
    1. Hips--Elvis example
    2. Legs--compare with foundation of building
    3. Feet--show different angles

II. Nonperformance Factors
  A. Objects
    1. Present--clothes, home, office
    2. Past--things we have constructed--example of my former home
  B. Space
    1. Personal
      a. Stress cultural differences--give example of visit to Greece
      b. Space bubble--example of waiting for bus or in line
      c. Acceptable distance--cite statistics by Hall
    2. Constructed--office arrangement, fences, etc.
  C. Time--humorous definition from Esquire, Wetumpka example

CONCLUSION

Sum: Reteach main points
Remot: Stress importance of nonverbal to each student
Clos: Tell humorous story of how deaf man solved problem; challenge students to do likewise

SUMMARY

A lesson plan is a plan for learning. The complete cycle of lesson planning may include eight steps:

1. Determine the objective and state in terms of what the students are expected to learn.

2. Research the topic as defined by the objective. To obtain useful

and appropriate subject matter material we should draw first from our own personal knowledge of the subject, then draw on the expertise of others around us, and finally make effective use of a library.

3. Select the appropriate instructional method with regard to designated student outcomes and acceptable student activities.

4. Identify a usable lesson planning format. We need to select a format that serves as a checkpoint for well-planned learning experiences and provides a worthwhile teaching aid.

5. Decide how to organize the lesson. Organization of main points and subpoints is important because it helps instructors and students remember the material. Commonly used patterns of organization are time, space, cause/effect, problem/solution, pro/con, and topical. Strategies for how we organize material with these patterns are also important. Although we may choose one pattern for organizing our main points, we may choose a different pattern for organizing subpoints.

6. Choosing support material. Students understand supported ideas or assertions better than if support is not given. Definitions, examples, and comparisons are used mainly as clarification support. Statistics and testimony from experts can be used for either clarification or proof.

7. Beginning and ending the lesson. The beginning or introduction generally has three necessary elements: attention, motivation, and overview of what is to follow. The conclusion has three parts: final summary (or summation in lessons teaching principles), remotivation, and closure.

8. Preparing the final outline. We may prepare two versions of the outline. One version will be very complete so the information remains intact if we want to return to it at a later time. A second version will be much briefer so we can teach from it in the classroom.

SECTION B

LESSON DEVELOPMENT

Chapter	Title	Page
7	Developing Knowledge Level Lessons	7-1
8	Developing Comprehension Level Lessons	8-1
9	Developing Higher Level Cognitive Lessons	9-1
10	Writing and Measuring Affective Objectives	10-1

Developing, organizing, and supporting academic lessons is the focus of Section B. We must plan carefully to achieve different levels of knowledge, understanding, and attitudes. Several approaches and patterns of lesson development promote student learning. Regardless of how well we write learning objectives, poor lesson development can hinder or even prevent desired learning outcomes.

Chapter 7

DEVELOPING KNOWLEDGE LEVEL LESSONS

Introduction

Most of us could not do our jobs without knowing a great many facts. As described in previous chapters, the ability to recall or recognize facts is classified as learning at the knowledge level. According to most systems for classifying learning objectives (see Chapter 3), the task of memorizing factual information is a low-level mental process. In the Bloom taxonomy which is the primary system for this manual, knowledge level learning is the most elementary and least complex of the levels of learning in the cognitive domain. It may be the lowest of the levels of learning, but it is the absolutely necessary foundation upon which all higher levels of learning are built.

Learning facts is not necessarily easy. Some information is fairly simple to remember--the USAF rank structure, the major air commands, or the range and payloads of various aircraft. Other information such as complex operating procedures and the wide range of complex regulations with which we must comply is extremely difficult to learn and remember.

Appropriateness of Classroom Instruction at the Knowledge Level

As difficult as knowledge level lessons can be for the student, they are generally the easiest for instructors to plan and teach. Instructors may be tempted to teach at the knowledge level to avoid the more difficult task of developing understanding. While it is important to learn facts, we must be careful that we do not use too much classroom time teaching at the knowledge level at the expense of higher levels of learning. To teach facts we should normally use reading assignments, slide-tape presentations, and other non-instructor controlled methods whenever feasible, and save valuable classroom time for other uses.

There are many times, however, when we will want to use classroom time for knowledge level information. We are probably justified in using class time, for small or large groups, to teach at the knowledge level if any one of the following conditions exist:

- Rapidly changing subject matter. Many areas of instruction change too rapidly to keep printed materials and other media up to date. In order to keep instruction current, we may have to teach knowledge level lessons in class even though other methods of presentation could better do the job.

- Cost effectiveness. In many cases, it may simply cost less to teach knowledge level information in a classroom setting. We may discover that the cost of preparing another medium is more than the cost of the classroom presentation. Costs that might affect this decision include media production, course administration, study carrels, and costs of changes or updating.

- Need for interpretation of facts. No matter how clear and straightforward, many facts are difficult to learn without instructor assistance. We rarely get a class of adult students with backgrounds and reading levels that match perfectly with what they need to learn.

An instructor may be of assistance in interpreting technical terms, important data, and charts or graphs. It is difficult for students to learn knowledge level information if they do not understand the basic terminology that they are committing to memory.

- Increasing the significance of subject matter. We can make knowledge level material more significant in the eyes of our students by bringing it out of the text and into our classroom. The importance of the material for our students may be increased by the special attention that we give it. Out of so many facts that could be learned from any course, we may signal to our students that some material is more important than others by devoting some class time to it. A review of a reading assignment, going over a handout in class, or information important enough to bring in an outside speaker are all cues to our students that the subject matter has special significance.

- Need for human interaction. Because much of the knowledge level information that must be learned is dry and difficult, students become discouraged or disinterested. Even highly motivated students quickly tire of this type learning. It may be to their best interest, and ours, to have some instruction in a group to raise interest or sustain motivation. Often individualized study assignments, especially over a long period of time, fail to satisfy basic needs for interaction with others. An awareness of group dynamics is important even at this level of instruction.

Planning Knowledge Level Lessons

Teaching information at the knowledge level is relatively simple compared to the higher levels of learning. Good planning, however, is as vital at this level as it is at any other. Planning for students to learn and remember important factual information can be a challenge. Much of that challenge comes from the need to keep instruction on target and free from unnecessary complications.

Patterns and strategies. Factual information should be well organized for learning. Although the reasons for learning many facts are obvious, the pattern and strategy of the plan can affect learning. Although the material on organization patterns and strategies is introduced in Chapter 6, a brief discussion of how they apply to teaching at the knowledge level is appropriate.

The pattern of lesson development can help a student organize and retain information. In knowledge level lessons, the pattern of organization should be obvious and make sense. Information about the structure of a unit may be learned more easily and retained if it is presented spatially (top to bottom as in an organization chart, or by geographic regions going from one direction to another in a logical fashion). Safety information, first aid, and many other similar topics can be organized into a cause and effect pattern. Sequencing or ordering is a very successful way to organize for teaching procedures. Topical planning is a very useful pattern for knowledge level instruction. Topical planning is especially effective since so much of the factual material we teach naturally groups itself this way when the topic outline is made clear to the students.

Strategies for dealing with factual information may be looked at as applied common sense. Most of us prefer to learn new information by relating it to what we already know. There are many strategies for presenting facts to our students which capitalize on this need to relate the new to the old. The obvious strategy of known to unknown works well at the knowledge level. Building from simple information to more complex information, still at the knowledge level, is generally another good strategy. Unfortunately, many experts fail to plan for linking new information to old because the relationship seems so obvious, to the expert but not to the student. The plan for teaching and learning should be focused on the needs of students and must take their beginning level of knowledge into account.

Developing the Teaching Outline

By the time we sit down to develop an actual outline for teaching and learning, several important steps in the planning process are already done. Lesson objectives have been written by or for us. We have researched the subject, and we begin to see a logical organization of the material and a basic strategy for teaching. We may even be given a skeleton lesson outline which we are to expand on and "personalize." In most cases, we have already selected an appropriate teaching method.

The teaching outline of our lesson plan will be the product of our decisions in all of these matters. Whether we are writing our own teaching outline from scratch or personalizing one given to us, the teaching outline must make sense both to us and to our students. The lesson organization and planning strategy should be obvious. In addition to keeping us on track with our lesson, we should also share our outline with the students (in an overview) so that they will know how the lesson will proceed.

The teaching outline for this level of learning may range from a few note cards to several pages, but the outline should always be simple and straightforward. The following examples illustrate three simple knowledge level teaching outlines. Each example contains objectives written at the knowledge level and main points in outline form. Considerably more detail would be required to satisfy the need for a teachable plan, but the examples do illustrate the relatively simple teaching outline of most knowledge level lessons.

Example 1:

Objectives/Main Points

1. Know the mission of the Strategic Air Command.
    a. ....
    b. ....
2. Know the history of the Strategic Air Command.
    a. ....
    b. ....
3. Know the organization of the Strategic Air Command.
    a. ....
    b. ....

This example illustrates a plan organized topically; the teaching strategy is probably known to unknown. The instructor has calculated that these three objectives represent a logical way to organize this material for both teaching and learning. In addition, the instructor has started the lesson plan with information on the mission because it is assumed that students have some previous knowledge in this area. After receiving the information on mission and history, students are now prepared to tackle the most complex and lengthy area--organization.

Example 2:

Objectives/Main Points

1. Know the steps of the USAF Instructional System Development (ISD) Model.
    a. Step 1
    b. Step 2
    .
    .

2. Know techniques required to use the ISD Model.
    a. Step 1
    b. Step 2
    .
    .

3. Know major problems expected in implementing the ISD Model.
    a. Step 1
    b. Step 2
    .
    .

(or)

Objectives/Main Points

1. Know Step 1 of the USAF Instructional System Development Model.
    a. Description
    b. Techniques
    c. Problem Areas

2. Know Step 2 of the USAF Instructional System Development Model.
    a. Description
    b. Techniques
    c. Problem Areas

In this example, the nature of the ISD model and the three items concerning each provides us with at least two logical patterns for lesson development. The first outline follows a topical development for the objectives with a sequential development for the main points. An equally good alternative is illustrated in the second outline. In this case, the objectives lesson outline are the sequential steps in the ISD process, and the three areas of information about each are set up as topical main points. The strategy is also driven by the ISD model. The philosophy behind this approach to teaching and learning is already built into the five step model and forms the strategy of the lesson.

Example 3:

Objectives/Main Points

1. Know the primary causes of child abuse.
    a. Cause 1
    b. Cause 2
    c. Cause 3

2. Know the primary effects of child abuse.
    a. Effect 1
    b. Effect 2
    c. Effect 3

This example shows the fairly common cause-effect pattern of organization. Depending on the actual topic being developed, the main points might have been arranged in a simple to complex or known to unknown strategy.

Each of these examples illustrates simple but logical development for a knowledge level lesson. Basic outlining skills and a little planning will add greatly to effective teaching at the knowledge level.

Support Material. All lessons, at whatever level, require adequate and appropriate support material. But unlike support material for lessons at higher levels of learning, support for knowledge level lessons is provided for its own sake: to contribute directly to the student's ability to remember what is being taught. Examples are not given to enable the student to generate new examples. Steps in a procedure are taught in a way that they will be remembered, not so that the student can interpret the reason for the procedure. Statistics and testimony are taught to be remembered in themselves, not to raise the students' understanding to a higher level of abstraction.

Testimony, supplemental data, and statistics--important for the higher levels--should be kept to a minimum if they interfere with the learning of important information. For this reason, very little information not important enough to be remembered should be contained in a knowledge level plan. Instructors who use support material to develop understanding, rather than to promote retention, should reexamine the lesson objective. Continued need for new examples, need for discussion to clarify points, or a dissatisfaction with the low level of test items may be a clue that we should be teaching to a higher level of learning.

Teaching the Lesson

Instructors teaching at the knowledge level must make a real contribution to learning. If not, they come close to being little more than audiovisual aids. Instructors can best add those benefits that come from interaction between human beings. Keeping in mind that the flow of knowledge level information lessens the importance of a live instructor, we should at least make certain that we are no less effective than a well-prepared visual aid.

Clarity of Presentation. Our lesson plan should be developed fully enough that we will have little need to restate ourselves for the sake of clarity. The presentation in a knowledge level lesson should add to the student's ability to learn the factual information. The more complex the facts or the processes being taught, the greater the need for a clear presentation.

Redundancy of Information. Some redundancy is probably desirable in a knowledge level lesson. We should not be afraid to say something more than once or through a different medium if it can help our students to remember. We can build desirable redundancy into knowledge level lessons in several ways.

- Summarize when needed. Interim and final summaries will insure that all information has been noted.

- Supplement presentations. Readings and handouts are invaluable study aids for knowledge level lessons, particularly if we show students how they support the lesson.

- Use more than one teaching medium during the lesson. We should seek opportunities to support verbal information with visuals. Overhead transparencies, slides, and other projected media allow us to go after learning by sight as well as sound. Perhaps our best teaching aid for the average size class or seminar is still the chalkboard. We owe our students the chance to have what they hear reinforced by what they see.

- Helping students remember. Knowledge level information can be presented in group situations, but students normally need to study on their own to memorize. If we have to learn a long string of facts, we would probably not try to do it while someone is lecturing. We should organize and present knowledge level lessons so that we have done all we can to help students remember what has been taught. We should take advantage of what we know about memory to help our students get the most from the lesson:

1. Avoid needless distractors during the presentation. Humor, for instance, can add greatly to a lesson, but it may also interfere with the orderly transfer of information. See Chapter 13 for a further discussion of humor while lecturing.

2. Stick to a well thought out plan. When we teach in a system using objectives, we have to resist the temptation to take off in some unplanned direction because it seems more attractive at the moment.

3. Build in memory aids where possible. We should suggest acronyms, word pictures, and other memory aids when possible. These devices can help the memory retain facts.

4. Encourage and plan for study to aid retention. Students should develop study systems which are effective for learning facts. As instructors we can suggest flash cards, drill and repetition, studying with another, or other methods that seem appropriate.

5. Quiz and review frequently. Students should have an opportunity to test their memories before doing formal evaluation. By the time they are tested for real, students should already know whether they have been able to store and retrieve the information we have given them. Periodic checkups on the subject matter are also a good way to lessen the rate of forgetting. Material taught once and tested once may be forgotten at once.

Summary

Teaching at the knowledge level requires logical planning and good presentation. Classroom lessons at this level should be looked at carefully to see if they can be replaced by readings or other media. Knowledge level material which must be presented in class should be done so in the clearest way possible and benefit from the presence of an instructor.

The pattern of organization for this level of instruction should be clear and help the student learn and retain the material. The strategy for teaching should take into account the need for students to relate new material to what is already known.

Lessons should be planned and taught with a focus on memory. Aids to memorization such as redundant teaching and use of multimedia are important points at this level of learning. While knowledge level lessons are at the lower end of the cognitive taxonomy, learning and remembering facts is the foundation upon which the understanding of concepts and principles is built.

Chapter 8

DEVELOPING COMPREHENSION LEVEL LESSONS

Introduction

Most instruction in American schools and colleges involves comprehension and not just simple recall. Similarly, we conduct much Air Force academic instruction at the comprehension level of learning or higher. Unless students progress through the comprehension level to determine "how" and "why" something is done, they will experience difficulty applying information or skills in new situations on the job. (Note Chapter 4 for the position of comprehension in the taxonomy of educational objectives.)

Comprehension is defined as the ability to generalize or to grasp the meaning of material. Students are expected to understand what is being communicated and to be able to make some use of the material or ideas contained in it. A student can demonstrate this ability by translating material from one form to another, interpreting material, or estimating future trends. Comprehension is one step beyond the simple remembering of material and represents the lowest of the understanding levels.

When conducting lessons at the comprehension level, instructors usually teach either concepts or principles. Using this classification system, concept teaching needs to be addressed first, since principles are statements of relationship between two or more concepts.

The Teaching of Concepts

A concept is a class of people, objects, events, ideas, or actions which are grouped together on the basis of shared attributes or characteristics, and are called the same name. When we teach a concept we are referring to one of these classes or categories. The members in the class are put into the same category on the basis of shared attributes. These shared attributes are critical to the identity of the concept. All members of the class sharing the critical attributes are called by the same name.

The term "instructor" is a concept. It refers to a class of people which is distinguished from others by distinctive duties and responsibilities. Only those performing these duties can be called instructors. The concept "bomber" refers to a class of objects with the critical attributes which distinguish it from fighter, transport, and reconnaissance aircraft. Terms such as counterinsurgency, unconventional warfare, doctrine, strategy, and tactics are concepts. In fact, most of the terms we use in the classroom are concepts.

A specific individual, object, event, idea, or action is not a concept. No class is represented. Sergeant Ed Jacobs is an individual and not a category of people. While "war" is a concept, World War II is a specific event and not a class of wars. "Book" is a concept, but Tolstoy's War and Peace is not, since no class or category is represented.

For planning purposes, instructors need to understand the reasoning process students go through in comprehending concepts. This understanding assists in organizing the concept teaching plan.

Generalizing. Humans have the mental ability to make the same response (give the same name) to a new example of something which differs in some way from previously met examples. When children reach the comprehension level on the concept "dog," they can point to a schnauzer, poodle, or collie and say dog. Although each new example of a dog differs from their beagle or German shepherd, they can correctly call each new example a dog. Similarly, a student who comprehends the concept "strategy" can correctly label a new grouping of actions by a military commander as "strategy." In each instance the person is generalizing.

Discriminating: Humans also have the mental ability to make a different response for a nonexample of something which shares some properties or characteristics with previous examples. This process is called discrimination. Children who comprehend the concept "dog" can correctly differentiate a dog from a cat or fox even though all share certain attributes such as four legs and sharp teeth. Similarly, a student who comprehends the concept "strategy" can differentiate the term from "tactics" even though the actions share certain attributes or characteristics.

When we evaluate student performance at the comprehension level, we often ask them to give or recognize a new example of something we have taught. Students who respond correctly are able to generalize. When we ask students to differentiate between examples and nonexamples of something we teach and they respond correctly, they are able to discriminate. Students who comprehend a lesson on the concept "prejudice" should be able to identify which written summaries of human interactions are examples illustrating prejudice and which are not.

Concept teaching is fundamental to instruction at the comprehension level. As instructors, we want our students to be able to solve problems on the job (application). Problem solving requires that certain rules or principles have been learned. These principles cannot be learned until certain concepts have been learned. In short, some educational objectives are prerequisite to others.

The ability to spout a memorized definition of an important concept is of little or no value on the job if a student cannot recognize new examples and nonexamples of that concept and use the concept in the work setting. Reciting the definition and characteristics of leadership (a concept) is of little value on the job unless the person can apply leadership in real-life situations. Thus, knowledge level instruction for teaching concepts is insufficient.

Comprehension level instruction provides the missing link between recalling information about a concept and the direct application of the concept in real-life settings.

Organizing a Concept Teaching Plan

Since concept teaching is fundamental to instruction at the comprehension level, attention needs to be focused on the organization of the lesson plan. Whether five minutes or several hours are required to teach a concept, the following format can be used: define the concept, teach its critical attributes, give examples, and give nonexamples.

The definition. Defining the concept is the first step in concept teaching. Concept definitions can be found in dictionaries, glossaries, and in the content of textbooks. Those who are subject experts can form their own definitions. Concept definitions are statements identifying critical attributes and indicating how these attributes are combined. Often, we can start with the critical attributes and use them to write a definition.

The attributes. A difficult step in teaching a concept is differentiating among its attributes. An attribute is a special name used to refer to characteristics that determine whether a person, object, event, idea, or action is a member of a particular class (a concept). Critical attributes must be present in all members of the class. Variable attributes are characteristics shared by some but not all members of the class. They are not necessary for determining class membership.

If we wanted to teach the simple concept "stool" to students, we might start with a dictionary definition. A stool is a single seat on legs or a pedestal and without arms or a back. In this definition, the critical attributes are (1) a single seat with (2) the seat resting on legs or a pedestal, and it cannot have (3) arms or (4) a back. Variable attributes would include characteristics such as a round seat, a rotating seat, four legs, and a covering of leather material. The variable attributes are shared by some members of the class but do not determine class membership. A stool may have a square seat, a fixed seat, a varying number of legs, or have a cloth covering or no covering at all.

If we do not have the expertise to label characteristics properly as critical attributes and variable attributes, then we should turn to experts for assistance.

Examples: To make conceptual learning meaningful, we need good sets of examples and nonexamples. We build an understanding of concepts on examples. We vary the examples in such a way that students are able to make the discriminations and generalizations on which real understanding depends. In selecting teaching examples, we should use ones that are as different as possible in variable attributes. Otherwise students may believe a particular variable attribute is critical to comprehending the concept. If each example of a stool shows a round seat, the student may believe that all stools have round seats. However, all examples must illustrate the critical attributes possessed by members of the class.

Nonexamples. We should select nonexamples that vary in the critical attribute omitted. For the stool example, a good nonexample would be a seat for two people, such as a love seat. Since a stool must have legs or a pedestal, a single seat suspended from the ceiling would serve as another nonexample. Nonexamples containing arms and a back should also be included.

Technically everything that is not an example is a nonexample. However, most nonexamples are not useful for concept instruction. Only nonexamples that resemble examples and hence represent a source of confusion for students are useful nonexamples. Generally, when we use the word nonexample, we are referring only to those instances that a student might incorrectly call an example. For each example, we should try to collect or devise a matched nonexample.

Whenever a comprehension level lesson calls for a definition, a concept lesson or concept teaching point is probably needed. The recommended organization in this chapter can be used for simple concepts like stool or for complicated concepts like Instructional System Development (ISD).

Testing Concept Learning

Students who learn new concepts should be able to generalize their learning to the point that they can recognize new examples of the concept when they see them. In addition, they must be able to discriminate between an example and a nonexample of a given concept.

Test items which require generalizing and discriminating are essential for testing concept learning. Test items which test concept learning may be either selection or supply items (see Chapter 21). These items generally require the use of a scenario or other description of an alleged example of a concept.

In supply questions, students may be asked to identify a concept from a scenario or may be required to describe a scenario which would meet all the critical attributes of a given concept. Selection items, particularly multiple choice, often contain a description or scenario in the stem. Students are then asked which concept the scenario illustrates or whether there is enough information given to qualify as an example or nonexample of the concept. See the test items in the lesson on the concept of democracy at the end of Chapter 13, Figure 22-3 (psychological concept of reinforcement), and Figure 22-6 (educational philosophies) for sample test items which measure concept learning.

Sample Concept Teaching Plans (Part I)

The lesson plan Part I illustrated in Figure 8-1 can be used for teaching a single concept.

In this model Part I, the term "concept" is included in the lesson objective. The objective might also be written simply as "comprehend prejudice." Samples of behavior are based on the lesson objective. Notice that the first main point is taught at the knowledge level, but the first sample of behavior requires an explanation in the student's own words. In teaching the concept, at the end of the first main point the student would simply be able to recall the definition the instructor gave. However, by the time the lesson is complete and the concept is developed, the instructor would want students to define the concept in their own words to show comprehension. The main points outlined in this model plan illustrate a recommended approach for teaching concepts at the comprehension level.

The lesson plan cover sheet illustrated in Figure 8-2 can be used for teaching multiple concepts in a single or several periods of instruction.

Figure 8-1

Lesson Objective: Comprehend the concept of prejudice.

Samples of Behavior:

1. Define prejudice in student's own words.
2. Distinguish critical attributes of prejudice from variable attributes and non-attributes.
3. Give new examples/nonexamples of prejudice.
4. Given scenarios containing transactions between persons, differentiate between prejudicial and non-prejudicial interactions.
5. Explain the concept of prejudice.

Main Points:

1. *(K) The definition of prejudice.
2. **(C) The critical attributes of prejudice.
3. **(C) Selected examples/nonexamples of prejudice.

*Knowledge level of learning. See page 4-1, adapted from Bloom's Cognitive Taxonomy.

**Comprehension level of learning. See page 4-1, adapted from Bloom's Cognitive Taxonomy.

Figure 8-2

Lesson Objectives: Comprehend (1) authoritarian, (2) laissez-faire, and (3) democratic leadership.

Samples of Behavior:

1. Define authoritarian, laissez-faire, and democratic leadership in student's own words.
2. Distinguish critical attributes of authoritarian, laissez-faire, and democratic leadership from variable or nonattributes.
3. Distinguish examples from nonexamples of authoritarian, laissez-faire, and democratic leadership.
4. Explain the concepts of authoritarian, laissez-faire, and democratic leadership.

Lesson Objectives:

1. (C) Authoritarian leadership

   Main Points:

   a. (K) The definition of authoritarian leadership.

   b. (C) The critical attributes of authoritarian leadership.

   c. (C) Selected examples/nonexamples of authoritarian leadership.

2. (C) Laissez-faire leadership

Main Points:

a. (K) The definition of laissez-faire leadership.

b. (C) The critical attributes of laissez-faire leadership.

c. (C) Selected examples/nonexamples of laissez-faire leadership.

3. (C) Democratic leadership

Main Points:

a. (K) The definition of democratic leadership.

b. (C) The critical attributes of democratic leadership.

c. (C) Selected examples/nonexamples of democratic leadership.

In this model Part I, three concepts are being taught. Although the term "concepts" is omitted from the objective, each term represents a class or category of leadership. Samples of behavior are derived from each concept. The instructor should ensure an adequate sampling of each objective. Each concept is developed using definitions, attributes, examples, and nonexamples.

As we have seen thus far, the terms we use for communicating in the classroom usually represent concepts. When an understanding of key concepts is essential to comprehension of a lesson objective, we need to take the time to insure that students reach the comprehension level on each concept in the objective. Once students understand the concepts we are teaching, we can build on these concepts to more complex learning.

The Teaching of Principles

A principle is a statement of the relationship between two or more concepts. The principle is stated in terms of a conclusion (generalization) about a class of people, objects, events, ideas, or actions.

The statement "Barriers to creativity inhibit innovation in classroom instruction" is a principle. A relationship is established between concepts. To comprehend this relationship in a lesson, students need to comprehend the following concepts: barriers, creativity, inhibition, innovation, classroom, and instruction. In addition, students need to comprehend the new concepts formed by combinations of these concepts. When barriers and creativity are combined, we have a new concept "barriers to creativity." Similarly, when the concepts in the statement's predicate are combined, a new concept is formed representing actions (a class) which "inhibit innovation in classroom instruction." The relationship between the combined concept in the subject and the combined concept in the predicate becomes very important when we plan lessons using deductive reasoning as we will see below.

Other examples of principles: urban warfare serves as a modern form of revolution, visual aids enhance an instructor's presentations, values influence a person's motivation, and the tactics employed by urban guerrillas pose a direct threat to the international order. Each statement has a subject and a predicate with a relationship established between concepts. Each statement could serve as a lesson objective or as a main supporting point for another principle or concept being developed as an objective.

The statement "Sergeant Jones teaches military science" is not a principle. The subject, Sergeant Jones, is not a concept. The predicate is a concept representing a class of people who teach military science. Since the subject of the statement is not a concept, we do not have the statement of a relationship between concepts. Neither is "Military strategy in unconventional warfare" a principle. While the phrase involves more than one concept, a critical attribute of a principle is missing--the statement of a relationship between concepts. Closer examination of the phrase "military strategy in unconventional warfare" will reveal that it is a concept. The subject could be effectively taught using definitions, attributes, examples, and nonexamples.

The teaching of principles is very important in Air Force instruction. If students are going to comprehend the principles taught, they must be able to reason logically. Logically organized lesson plans will assist students in reasoning through to the principles we are teaching.

Logical Lesson Planning

As we organize our lessons to teach principles, some understanding of deductive reasoning will assist in planning lessons organized topically.

Deductive reasoning. Deductive reasoning is a mental process in which we start with a principle to be taught and then apply this principle in specific instances to form supporting main points. The reasoning is from general to specific. For example, suppose our lesson objective read: "The objective of this lesson is for each student to comprehend that barriers to creativity inhibit innovation in classroom instruction." The underlined portion of the objective is a principle representing the content to be taught. If a topical pattern is chosen for lesson development, the focus should be on the subject of the objective statement, barriers to creativity. By moving from the general to the specific (deductive reasoning), we know from our review of lesson content that four common barriers to creativity are fear, prejudice, habit, and inertia. If the lesson content provides logical support for the principle in the objective, then we can reason that fear, prejudice, habit, and inertia (the specific instances) each inhibit innovation in classroom instruction. The reasoning might be depicted as follows:

> Barriers to creativity inhibit innovation in classroom instruction. Fear (prejudice, habit, inertia) is a barrier to creativity. Therefore, fear inhibits innovation in classroom instruction.

By starting with the principle, we topically divide the subject (first concept of the principle) into more specific instances and then draw a new conclusion about these specific instances.

The next step is to write main points as principles which support the lesson objective. The simplest way is to use the principles developed through deductive reasoning. The first main point might read, "Habit inhibits innovation in classroom instruction." Using a second approach, we might write the principle, "Habit causes instructors to resist change." The second principle is more specific than the first in showing how habit inhibits innovation in classroom instruction. Notice that the predicate in the second principle supports the predicate of the principle stated in the lesson objective. When the main points are made more specific, this requirement must be met. We could continue the process and write principles for fear, prejudice, and inertia using either approach indicated above. If the more specific statement is used in the first main point, then the same approach should be used in writing the other main points.

Since instructors seldom have time to develop all aspects of a topic, sampling is usually required. In the lesson above, the instructor must provide sufficient evidence to support the lesson objective. If two barriers to creativity are discussed in depth, this support should provide sufficient evidence for students to accept the conclusion stated as the principle in the objective. In this illustration, sampling of two of the four barriers should provide sufficient evidence to get students to accept the broader generalization. On another occasion we could be faced with fourteen defense mechanisms for use in supporting the principle "defense mechanisms allow the individual to cope with stress." Three might be chosen as main points to show how each allows the individual to cope with stress. Then we would ask the students to accept a conclusion about all defense mechanisms based upon a sampling of three. Samples should be representative of all members of the class. Enough samples should be chosen to provide sufficient evidence for drawing the correct conclusion.

When a topical organization is chosen as the best means for developing the lesson, the deductive reasoning process just described can be used effectively to develop main points from an objective stated as a principle. Similarly, a main point stated as a principle can be divided topically into logical subpoints by using the same method. Other common organizational patterns for use on comprehension level plans will be developed in the sample plans which follow in this chapter.

Inductive reasoning. While deductive reasoning assists us in developing logically organized plans, inductive reasoning can assist us in developing principles during classroom instruction. The process of moving from the specific to the general is called inductive reasoning. In teaching principles, we ask students to take pieces of evidence we present to form a related pattern and then draw a conclusion from the evidence. The pieces of evidence are definitions, examples, statistics, comparisons, and quotations or testimony used as support material. When skillfully put together by the instructor, these pieces of evidence and their relationship form a pattern which leads to a conclusion. Movement in the lesson is from specific instances (support) to a general conclusion (the principle).

For instance, a security police instructor presents the following evidence: (1) a security police vehicle overturned on perimeter road last week during an emergency run in the rain, (2) on Monday a dependent's car slid on a wet road into a BX oil truck, and (3) an airman's motorcycle went out of control on a base street following a rain shower. Based on this evidence, we would conclude that base roads are slippery when wet. The conclusion would be even stronger if a statistic was then added: "Last year, according to security police records, forty-five accidents occurred on base roads following rainstorms." The statistic serves as a summary of specific instances and as proof support for the conclusion drawn.

In teaching principles at the comprehension level, instructors should keep in mind the inductive nature of lesson development. In lecturing, we should include only those items of support material needed to clarify and prove the principle being taught. In discussions, we should keep students on track so material that is irrelevant to support of the principle does not develop. No matter what method is used, we should insure that we develop sufficient support for comprehension of the principle. Often strong support is lacking, and we can only say that based upon available evidence the conclusion stated as a principle is probably correct. In all cases, we must insure that a logical organization is used.

Testing Principle Learning

Students who learn new principles should be able to understand the relationship between two or more concepts. They ought to be able to translate these relationships into their own words, interpret instances where the principle is applied or ought to be applied, and make simple predictions based on their understanding of the principle involved. It is essential that test items which measure principle learning determine the extent to which students understand the relationship expressed in the principle rather than just an understanding of the individual concepts contained in the principle.

Test items which test concept learning may be either selection or supply items (see Chapter 21). Like concept test items, items which measure principle learning often reqire scenarios to set up the proper conditions for testing. In supply questions, students may be asked to identify a principle which is working or ought to be working in a given scenario. Selection items, particularly multiple choice, often contain a description or scenario in the stem. Students are then asked to identify the principle at work, to explain the principle involved, or to make a limited prediction about the situation based on their understanding of the principle. See the test items in the lesson on democracy at the end of Chapter 13, in the lesson on situation leadership at the end of Chapter 14, and in Figure 22-4 (management style) for sample test items which measure principle learning.

Sample Plans for Teaching Principles (The Part I—The Cover Sheet)

Various organizational patterns can be used successfully in teaching principles at the comprehension level. Some of the most common patterns are illustrated in Figure 8-3.

Topical Pattern. The following lesson plan cover sheet (Part I) illustrates the use of topical organization to teach a principle.

Figure 8-3

Lesson Objective: Comprehend that barriers to creativity inhibit innovation in classroom instruction.

Main Points:

1. (C) Habit causes instructors to resist change.
2. (C) Prejudice restricts an instructor's thinking.
3. (C) Barriers to creativity inhibit innovation in classroom instruction.

As indicated earlier in this chapter, the lesson objective is a principle and topical organization is used. Main points one and two are supporting principles which serve as specific instances developed from the lesson objective. Because only two of four common barriers are covered, the main points are samples which serve as evidence in support of the objective. If the students comprehend the two conclusions stated as main points, then the instructor has sufficient evidence to support the lesson objective. On the sample plan, notice that the lesson objective is repeated as the third main point. This approach is recommended to ensure that the instructor gives attention to development of the lesson objective. Additional barriers to creativity can be introduced in the third main point showing how they inhibit innovation in classroom instruction. The instructor has the final responsibility for tying the lesson together to show how all the lesson parts lead to the conclusion stated as the principle in the lesson objective.

The Part I just examined illustrates a single objective plan. The key principle in the objective was supported by the principles stated as main points. However, it would be possible for each main point to stand by itself as an objective for a lesson.

Figure 8-4

Lesson Objective One: Comprehend that habit causes instructors to resist creative change.

Main Points:

1. Reliance on old solutions for solving new problems causes instructors to resist creative change.
2. Fixed attitudes cause instructors to resist creative change.
3. Fixed behavioral patterns cause instructors to resist creative change.
4. Habit causes instructors to resist creative change.

Lesson Objective Two: Comprehend that prejudice restricts an instructor's creative thinking.

Main Points:

1. Emotional bias restricts an instructor's creative thinking.
2. Sticking to favorite teaching methods restricts an instructor's creative thinking.
3. Any irrational attitude of hostility directed against an individual student or group of students restricts an instructor's creative thinking.
4. Prejudice restricts an instructor's creative thinking.

This sample Part I illustrates a multi-objective plan. Two objectives are being taught in the same period of instruction. Each objective is then supported by main teaching points. The main points under each objective are developed topically. Each is a specific instance (principle) which supports the broader principle stated in the objective. Notice that the predicates of the objectives are repeated as predicates for the main points in this sample. While repeating the predicates in the main points appears redundant, such action ensures that principles are taught instead of concepts. For instance, teaching "fixed attitudes" as a concept requires different organization and support than teaching that "fixed attitudes cause instructors to resist creative change." While the experienced instructor may not repeat the predicate each time on the lesson plan, the mental connection is still made between the concepts to form the principle (between fixed attitudes and things that cause instructors to resist creative change).

The topical organizational patterns illustrated above are two of the most commonly used in teaching principles. Another common pattern is problem/solution.

Problem/Solution. Following is an example of a plan organized with a problem/solution organizational pattern.

Figure 8-5

Lesson Objective: Comprehend that widespread public concern is the most effective weapon available for combating child abuse.

Main Points:

1. (C) Child abuse damages the health of children.

2. (C) Widespread public concern is the most effective weapon available for combating child abuse.

On this Part I, the lesson objective is a statement of a relationship between concepts so a principle is involved. Main point one states the problem and main point two the solution. Main point two is a repeat of the objective indicating the instructor is putting emphasis on the solution for evaluation purposes.

If the instructor wanted to put equal emphasis on both the problem and solution in this lesson, it would be a multi-objective plan whose objectives might read: "Comprehend that (1) child abuse damages the health of children and (2) widespread public concern is the most effective weapon available for combating child abuse."

With a problem/solution pattern, the problem is normally covered before the solution although the reverse strategy might be used. Another common strategy is to develop the problem as a main point, examine several possible solutions as a main point, and then pick the best solution for development as the final main point.

Although the main points are organized using a problem/solution pattern, the subpoints could be developed topically. Using the principle in the first main point, child abuse could be divided into physical and mental abuse. Supporting subpoints might read: "(1) Physical abuse damages the child both physically and psychologically and (2) mental abuse damages the child psychologically" (or more simply, "(1) Physical abuse damages the health of children and (2) mental abuse damages the health of children)." Similarly, the subpoints for the solution could be developed topically.

Thus far we have examined topical and problem/solution patterns commonly used in developing comprehension level lessons for teaching principles. A cause/effect pattern can also be used effectively.

Cause/Effect. The following sample illustrates a cause/effect organizational pattern.

Figure 8-6

Lesson Objective: Comprehend that sexism inhibits effective utilization of skilled female employees.

Main Points:

1. (C) Sexist attitudes in the organization develop through a conditioning process.

2. (C) Sexism inhibits the effective utilization of skilled female employees.

The lesson objective is a statement of the relationship between two or more concepts. The statement can be divided into two major concepts representing sexism and actions inhibiting effective utilization of skilled female employees (a class of actions). The last main point is a restatement of the lesson objective because instructor emphasis in a cause/effect pattern of organization is usually on the effect. However, if the principles stated as cause and effect are of equal importance, then the plan would be classified as multi-objective. The objectives might read, "Comprehend that (1) sexist attitudes in the organization develop through a conditioning process and (2) sexism inhibits the effective utilization of skilled female employees."

Pro/Con Plus One. A fourth pattern for teaching principles might be labeled pro/con plus one. Often students are asked to examine both sides of an issue. If a discussion is being conducted, the lesson might end with students comprehending the pro and con positions, but no final conclusion is drawn. This development is acceptable for certain subjects, especially those involving a great deal of controversy. At other times, the instructor can lead students to a final conclusion if the lesson is planned properly. The following sample illustrates such a Part I.

Figure 8-7

Lesson Objective: Comprehend that a program of planned obsolescence must represent a balance between the exploitation of our natural resources and the generation of a higher standard of living.

Main Points:

1. (C) Planned obsolescence exploits our natural resources.
2. (C) Planned obsolescence generates a higher standard of living.
3. (C) A program of planned obsolescence must represent a balance between the exploitation of our natural resources and the generation of a higher standard of living.

While each main points is an important principle, the key principle in the objective goes beyond the main points in the reasoning process. Therefore, this sample illustrates the Part I of a single-objective plan. The objective is a final conclusion to be drawn. Main point three, the lesson objective, requires development which will encompass a comparison and contrast of the pro/con arguments.

For strategy, the instructor wants to develop a logical argument which would support the lesson objective. By starting with the con argument, students comprehend how planned obsolescence exploits our natural resources. Then attention turns to the value of such a program. Instead of leaving students wondering what conclusion should be drawn, the instructor leads them to a final conclusion (the lesson objective).

Sampling Achievement of the Objective

In the Part I's illustrated above, emphasis was placed on the organization of main points in support of a lesson objective. In this section, the focus is on samples of behavior written on the same objectives.

Sample one. This lesson was organized topically. Two principles were used as main points in support of the lesson objective. Appropriate samples for the objective follow:

Figure 8-8

Lesson Objective: Comprehend that barriers to creativity inhibit innovation in classroom instruction.

Samples of Behavior:

1. Describe the barriers to creativity and their relationship to classroom instruction.

2. Estimate the consequences on classroom instruction when barriers to creativity are in operation in a classroom.

3. Explain why barriers to creativity inhibit innovation in classroom instruction.

4. Interpret the relationship of the barriers to creativity to each other as they interact to inhibit innovation in classroom instruction.

Notice that the samples of behavior are written on the lesson objective, not on main points. The principle in the objective is a broader generalization than the principles stated as main points. Although samples of behavior written on the main points might provide some evidence of achievement of the objective, significant evidence must develop from samples of behavior written directly on the objective. If samples are written on the principles stated as main points, they should be used for test questions written for purposes of formative evaluation (sometimes referred to as diagnostic testing where results are used to assist students in overcoming deficiencies before a final evaluation or post test is given). Samples written on the objective would be used for summative evaluation (the final evaluation or post test).

Sample two. In this lesson, two parallel principles were stated as individual objectives.

Figure 8-9

Lesson Objective: Comprehend that (1) habit causes instructors to resist creative change and (2) prejudice restricts an instructor's creative thinking.

Samples of Behavior:

1a. Predict the effect on a group of instructors when a new supervisor takes over and makes an effort to innovate.

b. Explain the relationship between an instructor's habits and the desire to be creative in the classroom.

c. Give original examples of habits which cause instructors to resist creative change.

2a. Interpret the relationship between prejudice and an instructor's creative thinking.

b. Explain how prejudice acts as a barrier to an instructor's creativity in the classroom.

c. Give original examples of prejudice operating to restrict an instructor's creative thinking.

The objectives are of equal importance so a similar number of samples of behavior are written on each.

Sample three. This Part I was organized using a problem/solution pattern. The solution represented the last main point and the lesson objective.

Figure 8-10

Lesson Objective: Comprehend that widespread public concern is the most effective weapon available for combating child abuse.

Samples of Behavior:

1. Estimate the consequences of an aroused public on the problem of child abuse.

2. Interpret the relationship between public arousal over child abuse and the number of cases of child abuse.

3. Explain how a concerned public can reduce the number of child abuse cases.

4. Generalize as to actions a concerned public can take which will reduce the number of child abuse cases.

In this lesson, the instructor is putting emphasis on the solution for evaluation purposes. Therefore, the samples of behavior are written on the solution alone. In most problem/solution lessons, testing of the solution is all that is needed since an understanding of the solution can only be based upon an understanding of the problem. However, if the problem and solution are of equal importance, then a multi-objective format can be used and samples of behavior would be written for the problem and the solution.

Sample four. This Part I illustrated a cause/effect pattern. The objective and main point two stated the effect.

Figure 8-11

Lesson Objective: Comprehend that sexism inhibits effective utilization of skilled female employees.

Samples of Behavior:

1. Give original examples which illustrate ways sexism inhibits effective utilization of female employees.

2. Generalize as to the relationship between sexism and the effective utilization of female employees.

3. Estimate the consequences when sexism prevents effective utilization of skilled female employees.

4. Explain how sexism inhibits effective utilization of skilled female employees.

In this lesson, emphasis is being placed on the effect and not the cause. Therefore, samples of behavior are needed for the effect alone. In most cause/effect lessons, testing of the effect is all that is needed since an understanding of the effect is based upon an understanding of the cause. However, if the cause and effect are of equal importance, the plan would be multi-objective with samples of behavior written on both the cause and the effect.

Sample five. The Part I illustrates a con/pro plus one pattern.

Figure 8-12

Lesson Objective: Comprehend that a program of planned obsolescence must represent a balance between the exploitation of our natural resources and the generation of a higher standard of living.

Samples of Behavior:

1. Explain the economic cycle that is initiated by the practice of planned obsolescence.

2. Differentiate between positive and negative effects on our national economy of a program of planned obsolescence by the U.S. auto industry.

3. Estimate the effect on our economy of a program of planned obsolescence.

4. Predict ways in which industry and the government can work together to achieve a balance in conservation of resources and a higher standard of living through planned obsolescence.

Since there is a final conclusion in this lesson (the objective and main point three), samples of behavior should be based upon this conclusion. Samples based upon main points one and two would not provide the best source of evidence for evaluating achievement of the objective. If samples are written for main points one and two, they should be used as a basis for interim evaluation of students and not a final evaluation.

The Comprehension Level Summary

In developing a comprehension level lesson plan, we must plan summaries carefully. This rule holds true even in guided discussions where most of the support material comes from students.

A comprehension level summary (or summation) (1) reviews and expands on key material and (2) develops relationships which lead to a generalization which is (or supports) the instructional objective. Only the most significant information is restated and expanded and the focus is on how the items are related. This relationship allows a general conclusion to be drawn. The generalization will be either a concept or a principle. The concept or principle developed is the stated lesson objective or is used in support of the objective.

A comprehension level summary permits the introduction of new support material (from instructor or students) needed to establish the generalization. The summary may require from a few minutes to several minutes depending on the amount and complexity of the material. A summary for very complex material or for a block of instruction may require a much longer period of time.

A comprehension level summary is used to summarize support material needed for achieving a comprehension level main point. A summary of this type is not used for a knowledge level objective or a knowledge level main point.

Following is an example of a comprehension level summary for a lesson illustrated (the Part I) earlier in this chapter. While comprehension level summaries would normally be given after each of these main points, only the summary in the lesson conclusion is illustrated.

OBJECTIVE: Barriers to creativity inhibit innovation in classroom instruction.

MAIN POINTS:
1. Habit causes instructors to resist change.
2. Prejudice restricts an instructor's thinking.
3. Barriers to creativity inhibit innovation in classroom instruction.

SUMMARY: "In this lesson we have examined two barriers to creativity which inhibit innovation in classroom instruction. As a barrier to creativity, habit causes instructors to resist change. We find instructors using old solutions in trying to solve new problems because such an approach is comfortable. Instructors also develop fixed attitudes which prevent them from accepting something that is new or different. Many instructors develop fixed behavioral patterns which establish a very comfortable instructional routine. Old solutions, fixed attitudes, and fixed behavioral patterns are habits which cause instructors to resist change. Such habits become a barrier to the instructor's creativity.

"Prejudice, a second barrier to creativity, restricts an instructor's creative thinking. When instructors are prejudiced, emotional bias can cause them to reject new ideas. Prejudice can also cause instructors to stick to favorite teaching methods instead of trying innovative instructional methods. Or instructors can reserve the assignment of key curriculum hours for personal friends, often preventing new and talented instructors from improving a course. Emotional bias, sticking to favorite teaching methods, and assignment of key curriculum hours to friends are forms of prejudice which restrict an instructor's creative thinking. Such forms of prejudice become a barrier to the instructor's creativity.

"In viewing barriers to creativity, four are often mentioned. In addition to habit and prejudice, fear and inertia can serve as barriers to an instructor's creative efforts. The fear of ridicule, failure, being laughed at, or being branded as an oddball limits the frequency of new, original, or unconventional ideas among instructors. Inertia refers to a group or organization and might be viewed as organizational habit. Inertia causes groups to accept things as they are and discourages members from looking for new and better ways of doing things.

"The Air Force has a continuing need for instructors with the imagination to develop new and useful educational tools. However, corrective action will not occur until we instructors understand that the barriers to creativity inhibit innovation in classroom instruction."

Summary

Comprehension is one step beyond the simple remembering of material and represents the lowest level of understanding. Students who comprehend are able to grasp the meaning of material.

Concept teaching is fundamental to instruction at the comprehension level. A concept is a class of people, objects, events, ideas, or actions which are grouped together on the basis of shared attributes (characteristics) and are called the same name.

A student who comprehends a concept is able to generalize and recognize new examples of the concept which differ in some way from previously met examples. The student is also able to discriminate by identifying nonexamples which share some properties or characteristics with previous examples.

In teaching a concept, instructors define the concept, teach its critical attributes, give examples, and then nonexamples. A very difficult step in planning for concept teaching is to identify the critical attributes.

A principle is a statement of the relationship between two or more concepts. Principles represent conclusions drawn in comprehension level lessons and are based upon support material used in the lesson. Deductive reasoning is often used to develop main points which provide logical support to the lesson objective. Inductive reasoning is used in the classroom when an instructor puts supporting points together to draw conclusions.

Common organizational patterns used in comprehension level lessons for teaching principles include topical, problem/solution, cause/effect, and pro/con plus one.

Chapter 9

DEVELOPING HIGHER LEVEL COGNITIVE LESSONS

Introduction

Teaching and learning at the higher levels of understanding are difficult and challenging. These higher levels of understanding include the ability to apply, analyze, synthesize, and evaluate. That is not to say that the two lower levels of the cognitive taxonomy, knowledge and comprehension, necessarily come easily to students. They may not. But when students learn at the higher levels, they are called upon to put theory into practice. Both the instructor and the student are challenged to determine whether they can put into use what is being learned.

Little of what we learn in the classroom has real value in and of itself. Few concepts or principles have value unless students can apply them in real world situations. We should seriously question the learning of concepts and principles for which there is no apparent need for application.

Not all lessons should be taught and tested at the higher levels of learning. Efficient, effective teaching should be directed at levels which are neither higher nor lower than those appropriate for the desired learning outcomes.

Higher Levels of Cognitive Learning

APPLICATION. Students who can apply concepts and principles in new and different situations are operating at the application level of understanding. When students apply or recognize the application of principles and other generalizations, they have clearly gone beyond simple understanding. Students who can answer theory questions about principles of management, human relations, and other significant topics but are not able to put their understanding into practice are not yet at the application level of learning.

Students who solve problems by applying principles and other generalizations, and are able to explain why, are working at least at the application level. It is likely that any educational experience beyond an introductory course or basic principles course will and should involve the application level of learning. Instructors and course developers should plan lessons to this level with the realization that they require much more advance planning and more effective classroom skills than the lower levels of learning.

Instructional objectives at the application level are typically written as follows: (students should be able to)

- Apply the concepts of ISD to actual curriculum development situations.
- Apply basic human relations skills to situations involving superior - subordinate interpersonal relations.
- Apply their understanding of the Soviet definition of democracy to the interpretation of real or hypothetical situations.
- Apply the principles of war to scenarios in simulated, fictitious theaters of operation.

ANALYSIS. The ability to analyze a problem or situation into its component parts and to determine relationships which exist between them characterizes the student at the analysis level. Students retain and use analytic skills long after they have forgotten the specific subject matter used as a vehicle to develop the skills. "Scientific problem solving" and other examples of management tools for decision making characterize this level of learning.

Learning and testing at the analysis level and higher can be very complicated. There are few opportunities for "school solutions," and solutions to problems may not be clearly right or wrong. One student's analysis may be better than another, but both may be correct. Often students will discover relationships between elements of a situation not anticipated by the instructor. Being unable to anticipate and plan for all student interpretations can make teaching at the analysis level very challenging for even the most experienced instructor.

Instructional objectives at the analysis level are typically written as follows: (students should be able to)

- Analyze the communication network of an organization to determine discrepancies between the formal and informal organization chart.

- Conduct an analysis of work flow within an organization to determine potential areas of improved productivity.

- Analyze several sources of input into an accident investigation to determine fact and uncorroborated assumptions or allegations.

- Analyze apparently unrelated Soviet documents to identify principles of strategy or tactics.

SYNTHESIS. Students who can rearrange elements of a problem or situation in new and creative ways to form relationships not previously apparent are functioning at the very high level of cognition known as synthesis. As creativity is so important to this level of understanding, instructors may have to evaluate learning at this level without a model to compare to the student's answer or solution. Previously learned skills of deductive and inductive reasoning play a critical role in the student's ability to synthesize.

Learning and planning for learning at the synthesis level are certain to be complex and time consuming. Only experienced instructors should attempt to bring students to such a high level of understanding. Fortunately, or unfortunately depending on your point of view, few right or wrong answers to problems exist at this level. Rather than judge student work against a set of absolute standards, instructors must engage in a shared experience to explore new alternatives with students while providing scholarly guidance and seeking expert opinion.

Instructional objectives at the synthesis level are typically written as follows: (students should be able to)

- Synthesize data from recent armed conflicts to propose new principles of warfare which may affect future conflicts.

- Synthesize a variety of inputs from management decision-making techniques to determine a course of action which is highly supportive of the mission.

- Prepare an accident prevention plan for a new facility which synthesizes appropriate regulations as well as the most applicable principles of safety engineering.

- Synthesize relevant research and expert opinion into the revision of existing USAF instructor manuals and other related literature.

EVALUATION. Carefully considered judgments made by students based upon objective standards are characteristic of students at the highest level of learning, evaluation. Informed judgment on the part of students requires them to separate personal feelings from objective analysis and apply a set of quantitative and qualitative criteria to given situations. This level of learning requires understanding so complex that few USAF schools will include it in their curriculums. Where it is applicable, however, it represents the highest level of cognitive behavior and creative problem solving.

Teaching and testing at this level is the most difficult task facing an experienced instructor. Those instructors not at this level themselves should not even attempt to teach lessons at this level. The constant search for new and different problems to be evaluated for creative solutions is time consuming and difficult. Lack of time prevents many instructors from attempting higher learning outcomes. Teaching at this level represents the best of what we mean when we refer to the instructor as a real expert or a genuine scholar.

Instructional objectives at the evaluation level are typically written as follows: (students should be able to)

- Evaluate alternative operational plans to determine a justifiable course of action.

- Evaluate an original research project including data gathering techniques, research methodology, validity of findings, and logic of recommendations.

- Evaluate a system for the comparative assessment of the performance of subordinates to determine its applicability to a given situation.

- Evaluate the consistency of the major works of pre-revolutionary Communist propaganda with the significant post-revolutionary decrees of Lenin.

Principles of Teaching and Learning at the Higher Levels

There are several important principles to keep in mind as we plan and teach at all the higher levels. Several of these principles are outlined below. The significance of one of these principles over another will vary from situation to situation. However, they all apply generally to instruction at the higher levels. It is unlikely that instruction can be successful at these levels if any of these principles have been violated.

1. Carefully planned learning experiences at the desired level of learning facilitate the transfer of learning.

Students who are attempting to reach the higher levels of learning need sufficient opportunity to practice their newly acquired skills. If we take our students through the understanding of theory and then ask them to apply the theory without appropriate guidance, we are violating this critical principle. Students need to be guided through experiences at each level of the taxonomy so they can benefit from the constructive feedback of their instructor and other experts. Giving good feedback in carefully structured learning situations isn't spoon feeding. It's good teaching and critical for learning.

2. Experience with new, unfamiliar or substantially different learning and testing situations promotes insight at the higher levels of learning.

One of the most demanding elements of learning at the higher levels is the need to come up with many new and different situations for applying, analyzing, synthesizing, or evaluating principles and other generalizations. Essential principles may be the same in apparently diverse situations, but there must be enough new about the problems that students cannot solve them from rote memory or recollection. This critical need for instructors to develop apparently different teaching and learning situations with common principles places great demands on their subject matter expertise.

3. Effective feedback for learning demands flexibility in evaluating the products of student outputs at the higher levels.

Teaching, learning, and testing at the higher taxonomy levels places considerable extra demands on the flexibility of both the instructor and the student. Creativity is characteristic of all the higher levels and should be encouraged! Because instructors and students bring their unique background with them into the classroom, it is often impossible to anticipate the exact solution that any student may offer to a given problem.

While it is possible to retain the notion of a "school solution" for some application level learning, most learning at the application level and beyond probably does not lend itself to predetermined, model answers. Feedback to the student becomes much more difficult and subjective. Evaluation of the student becomes more complex because a solution or strategy proposed by a student may be 180° in the opposite direction of one proposed by the instructor and yet may be of equal or greater value. As complex as this situation may be, however, the instructor should remember that feedback and evaluation must remain objective to be worthwhile. Students are to solve problems and propose alternatives based upon solid facts and a thorough grasp of basic principles. Learning at the higher levels is disciplined and scholarly and must not be reduced to expressions of personal preference and unsubstantiated opinion. Unfortunately, the latter is often the case.

4. The need for supplemental expert evaluation of student outputs increases as the level of learning increases.

The increased use of expert judgement in evaluation is closely related to the need for flexibility in evaluating the products of student learning described above. By definitation, students must produce creative insights or solutions when working at the higher taxonomy levels. Often, this creativity is best judged by an objective evaluation of a proposed student output of learning by one or more experts in a given area of subject matter. The instructor may or may not be one of the expert judges.

Since learning activities at these higher levels are often highly individualized, students may be doing much, if not most, of their work outside of class. Often, instructors and students engage in mutual goal setting through negotiation. Research proposals and individual learning contracts are often characteristic of learning at these levels. In these cases, a mutually agreed upon plan is developed so that both the instructor and the student agree to the scope and procedures of the learning activity as well as the goals. Often, such research and individual contracts contain a provision to have them evaluated by third parties. The instructor may also evaluate the student product, but a more qualified expert may be consulted if the project is highly specialized or technical.

5. The focus of evaluation at the higher levels gradually shifts from a primary concern about the process used to arrive at a decision to the quality of the decision itself.

As students function at the higher levels of the taxonomy, it becomes less important to predict their exact behavior in the process of insight or problem solving. The product of their efforts eventually becomes more important than the process they go through. Sooner or later the student's work needs to be evaluated on whether or not a proposed solution will work. Eventually the books must balance and the solution must have the potential to relieve a problem. A solution which comes about as a result of applying a scientific problem solving method but doesn't work is unacceptable at the highest levels of learning. Checklists or models which are often so helpful at the application level may be of little or no value at the evaluation level. In fact, solutions generated by students functioning at this level of learning are characteristically different from one student to another in their approach and process.

When giving students feedback on their products, however, it may be necessary to help them with difficulties they had in their process of problem solving. This feedback should aid them in their next attempt to produce a product.

The concept of sampling described in Chapter 4 still has validity but must be approached with much more caution at the higher levels. Predictable samples of behavior characterize the knowledge and comprehension levels but become increasingly difficult from that point upward in the taxonomy. Many samples of behavior are broad, general indicators of student activity which serve as a baseline for evaluation. The samples can still be of value if they sufficiently describe the essential elements of the product at these levels. However, efforts to write criterion objectives at these levels may produce objectives which are so general as to be meaningless.

Lesson Planning

The basic skills for planning lessons at the higher cognitive levels are generally as described elsewhere throughout this pamphlet. The questioning skills discussed in Chapter 11 are critical to promoting learning at these levels. Chapter 26 describes feedback considerations which become more important as we go up the ladder of the taxonomy. Discussion skills (Chapter 14), and student differences (Chapter 27), and counseling skills (Chapter 29), all take on new and more important dimensions as we attempt to cause learning at the highest levels. Differences in techniques between planning lower and higher levels are most often in terms of degree rather than totally different skills.

- Style and format. Actual lesson plans are often quite simple for the conduct of class sessions for learning at these levels. The detailed step-by-step outline which characterizes lower level lesson plans may not be appropriate. The sample lesson plans attached to Chapters 13 through 17 illustrate the amount of detail recommended for teaching at the knowledge and comprehension levels. Chapter 15, The Case Study Method, contains an application level lesson plan with considerable detail.

Typical application level lesson plans, as well as those for higher levels, might be rather brief outlines of activity or as complex as the plan attached to Chapter 15, The Case Study. This lesson plan is in great detail because all of the information needed to teach this lesson has been included. This much detail in a lesson plan is unusual. Often, an outline is developed around a set of locally produced or commercially prepared materials. The exercises involved might include case studies, gaming exercises, in-basket exercises, role playing scenarios, or other elaborate simulations. See Chapter 12 for a description of these and other teaching methods. No attempt to illustrate these complex exercises will be attempted here beyond the Case Study in Chapter 15. Good simulation exercises are often many pages long and go beyond the scope of this chapter.

The brief outline lesson plan attached to this chapter illustrates the kind of plan which might go along with an elaborate simulation package. The in-basket exercise referred to is fictitious and is not attached to the plan. More detail in the plan might be appropriate, but the plan as illustrated here could accompany such an in-basket package. The elaborate detail which usually accompanies such exercises is assumed to be included with the package. Only the objective, the samples of behavior, and the general teaching outline for four periods of instruction are illustrated.

- Classroom instruction as a part of a total learning package. The higher the level of learning, the less relative significance traditional classroom instruction and time in class is likely to play. Much of what is to to be learned will be learned outside of class. Readings, research, personal interviews, and other individualized learning experiences play more of a role than at the lower levels. The classroom experiences may become the group anchor for individualized experiences. At these sessions, students may share what they have gleaned from their personal research and share their creative ideas for peer and instructor reaction. Depending on the overall methodology chosen, actual classroom time may account for just a fraction of the time spent in the total learning experience.

- Quality of the simulation in the learning experience. Perhaps the single biggest factor which discourages teaching at the higher cognitive levels is the need for quality simulation exercises. In order to develop a deep understanding in a subject area, it may be necessary for students to have several different opportunities to practice their new insights and skills in problem solving. Each of their practice exercises must include the elements which are critical to develop the higher levels of understanding, but each exercise must be sufficiently different so that it cannot be resolved through simple recall. Case studies, in-basket exercises, games, and role playing scenarios are a few of the complicated, time consuming, and often expensive approaches used to bring these simulations to the students.

- Time devoted to instruction. Although classroom activity may constitute a smaller percentage of the time spent on learning at the higher levels, more total classroom time may be required than with lower levels. That is, actual classroom time may be just 3 or 4 hours of a learning experience (reading, research, writing). But the 3 or 4 hours of classroom time may be double that typically devoted to any single topic in the curriculum. Instructors often raise the level of learning and increase the amount and complexity of outside work, only to find they are unsuccessful because no additional classroom time has been built into the schedule. Classroom time required for a higher level lesson may be two, three or more times that of a lower level lesson. A common mistake is to take a sequence of instructional periods and allocate them evenly without regard to the level of learning. One-third of the periods may be allocated to knowledge-level lessons, one-third to comprehension, and the remaining third to application level and beyond. Or an even distribution of time may be made among departments competing for scarce time. A good course analysis might reveal that the time allocation should be more like 10 percent to knowledge lessons, 30 percent to comprehension, and a full 60 percent or more of the available time committed to the higher levels.

- Maturity and sophistication of students. Students must take a more active role in their own learning process at the higher levels. Those who are used to being passive learners may suffer some initial trouble coping with learning at these higher levels. They can mistake the lack of lectures by the instructor as weakness or disinterest. They may need close attention and assistance during this period. In the opposite vein, relatively sophisticated students may resent interference from the instructor as they pursue objectives with a high degree of motivation. The instructor may become a barrier to learning in their eyes. As instructors, we will have to use our teaching and counseling skills to the fullest to try to map our individual strategy with each student. See pertinent section of Chapter 26, Using Feedback in the Classroom, and Chapter 27, Student Differences, for further discussion of dealing with the individual student.

- Subject matter expertise of instructors. The level of learning to which we teach is limited by the level of our own understanding. To be effective at the higher levels, we must be genuine experts in our subject. We can stay with a canned lesson plan at the lower levels and be quite successful. We are doomed to failure if we try that at the higher levels. We cannot apply, analyze, synthesize, and evaluate student learning outcomes unless our own level of understanding permits us to do so. Instructors cannot teach above their own level of learning.

- Special emphasis upon feedback. The highly individualistic nature of higher levels of learning makes quality feedback to students especially critical. Feedback here is meant to be in the sense of that described in Chapter 26 of this pamphlet. Evaluation or the passing of judgment on a student effort, is far less important than constructive feedback at these levels. Of course, at some time the instructor has to decide whether learning has occurred, but the primary emphasis should be placed on feedback to foster learning rather than labeling or grading. Good lecturers and even good discussion leaders may be uncomfortable with this feedback role. But the increased use and importance of feedback must be anticipated and planned into the curriculum. It is obvious that the quality of this feedback is related directly to both the subject matter expertise and the teaching and counseling skills of the instructor. The degree to which these skills are available must have a significant impact on the planning of individual lessons and the entire course.

Summary

The five important principles described earlier in this chapter for teaching and learning at the higher taxonomy levels place heavy demands on both instructors and students. Instructors become more like helpers or counselors and become partners in the learning process to a much greater extent than most of us are used to experiencing. While this change in roles may be very uncomfortable to some, most expert instructors find teaching at this level to be most rewarding. At these levels of learning, it is not unusual to hear instructors say, "I've learned as much as my students!"

As could be expected, there is a great deal of extra energy and effort expended by both instructors and students in working at the higher levels. Expenditures of energy and effort are very difficult to measure, however, but there is no doubt that there are increased demands upon both students and instructors. But this increased energy and effort does affect a very tangible asset, time. The time necessary to plan for and conduct higher level learning experiences is substantially greater for both instructors and students. In addition to the time spent in class by both, there is the need to do considerably more planning and preparation.

One-on-one conferences, individualized evaluations, and increased emphasis on feedback all place additional demands on time. Time, as a critical factor, must be accounted for by the instructor and the curriculum planner as instruction is developed at the higher levels of the cognitive taxonomy.

Instruction at these higher levels becomes increasingly student-centered. This student centeredness shifts much more of the burden for learning from instructors to students. Often, more learning occurs outside of class periods than within. Trial and error, discovery, and creative insight characterize student activity. Students may incorrectly sense a lack of direction or shortcomings in instructor expertise as they discover fewer and fewer answers that are clearly right or wrong. With the patient and skillful help of instructors with great subject matter expertise, these students can be guided to the highest and most satisfying levels of learning.

LESSON PLAN

Part I
COVER SHEET

LESSON TITLE: The Crisis at 1630
INSTRUCTOR: Kline Johnson

TEACHING METHOD: In-basket exercise
REFERENCES: AFM 50-62 and in-basket exercise "The Crisis at 1630, a Problem in the Management of Time," Dann and Brown, Watermill Press, Inc., Detroit, 1980.*

PART IA

LESSON OBJECTIVE: The objective of these lessons is for each student to analyze crisis situations to determine violations of time management principles.

SAMPLES OF BEHAVIOR:

1. Differentiate between contributing and noncontributing factors in situations involving crises in time management.

2. Explain the relationship between contributing factors to crises identified in time management scenarios and their resulting consequences.

3. Distinguish between factors which contribute to crises in time management as to whether the crises are to be accepted as "givens" or whether they are under the control of management.

4. Identify from scenarios patterns of managerial behavior which have contributed to specific crises in time management.

PART IB.

ORGANIZATIONAL PATTERN: Effect/Cause

STRATEGY: The four class periods devoted to this exercise will be almost equally divided between individual and group work. The teacher's guide for the in-basket exercise will be followed with minor variations to account for the pace of the group. The exercise is designed to provide individual practice in analyzing time management problems which have led to crises. All individuals are required to generate their own analyses, but the last period is set aside to reflect on the exercise, share different perspectives, and resolve apparent conflicts

*Fictitious exercise and not included as part of this plan.

Part II
TEACHING PLAN

Period 1 (50 minutes):

Review basic time management principles presented and discussed earlier in course
NOTE: Emphasize interrelationships between time management problems and their effects. Note synergic effect of multiple causes.

Explain "Crisis at 1630" exercise. Introduce ground rules for in-basket exercises. Discuss purpose of exercise. TO PRACTICE ANALYZING CRISES SITUATION FOR SPECIFIC OR GENERAL TIME MANAGEMENT PROBLEMS.

Distribute materials. Check each packet to ensure that all 23 items are included. Explain role of supplementary reading list. Emphasize need for independent work, thought, and action until 4th period. Explain importance of written analyses required for 4th period.

Begin exercise. Check EACH student to make sure that start up is correct and directions have been understood.

Period 2 (50 minutes):

Reorient group. Answer questions aloud that have value to group. Point out that each student should be completing analysis of item #17 by the end of this period. Announce availability to meet with individuals in private on individual problems related to the exercise.

Period 3 (50 minutes):

Reorient group. Make personal check of each individual's progress. Note any common errors observed during Period 3. Remind group of requirement to bring written analyses of exercise to next period. Schedule voluntary sessions with interested individuals.

Period 4 (100 minutes):

Review purpose of exercise. Comment on common mechanical and analytical errors observed in Periods 2 and 3.

Have three volunteers outline their analyses on chalkboard. Analyze similarities and differences. To the maximum extent possible, let other students carry discussion.

NOTE: Make sure that contributing and noncontributing factors emerge clearly. Reemphasize basic principles on each point of disagreement.

Summarize: Use chalkboard input from the three students to close the discussion. Emphasize agreement on principles and place disagreements in perspective.

Collect papers and announce schedule of individual appointments (20 minutes each) to discuss critique of paper.

Chapter 10

WRITING AND MEASURING AFFECTIVE OBJECTIVES

All instructors should care about the attitudes of their students. We want our students to have positive feelings about our courses, our schools, and ourselves as instructors. Some courses are designed specifically to affect attitudes but do so only informally or with no real plan. Whether we plan to or not, much of what we do as instructors affects the attitudes of our students. But potential to affect student attitudes about us and the way they feel about what we teach is too important to leave to chance.

As we have seen in previous chapters, we can and should plan for measurable learning outcomes. Although we have focused on cognitive or subject matter outcomes to this point, we should not ignore the need to plan for attitude development. Attitude development is complicated and must be approached with caution, but the affective domain should still be of great interest to us as instructors. We should realize our potential effect upon student attitudes. Further, we should be aware that many of the techniques for writing and measuring cognitive objectives apply to the affective domain. We may find that affective objectives are more difficult to write and that the measuring tools are less precise. But paying more systematic attention to the affective domain will improve our course.

There are at least four elements of writing and measuring objectives for student attitude development that should be of concern to the instructor:

1. Clarifying what is meant by the term attitude (or affect).

2. Writing attitude development objectives.

3. Measuring student attitudes.

4. Designing a curriculum to develop attitudes in a desired direction.

This chapter will be limited to a discussion of the first three of these topics, which are of practical concern to the classroom instructor.

The fourth topic, designing a curriculum to develop attitudes in a desired direction, is beyond the scope of this manual. Classroom instructors are usually not involved with curriculum development at this level. Among the many schools and courses which successfully develop attitudes are Basic Military Training, Officer Training School, pilot training, survival training, and virtually all safety courses. But we could not describe their approaches to attitude development here without writing a separate manual on the subject. A person who wants to develop an effective curriculum plan for developing student attitudes on a systematic basis would be wise to study the programs of successful schools.

Although most of our objectives are cognitive, we would often like an indication of the effect our handling of the subject has on student attitudes. In those cases, it is not necessary to plan for affective outcomes separate from the cognitive outcomes. Much of the affective impact of cognitive lessons is in the way teachers deal with the subject matter. If we teach it effectively, students' attitudes will probably be positive. If we do the job badly, their attitudes might well be negative.

There are still the other areas of interest to the instructor in developing student attitudes without getting into the broad implications of curriculum development. The definition and structure of student attitude development is important to us. The way we write and measure attitude objectives for our own classes is something we should understand. We should also care about the ways our daily classroom behavior affects student attitudes.

A Structure for Attitude Development--the Affective Taxonomy

A basic structure for attitude development was first presented by Krathwohl and associates in 1956. Their work provides a taxonomy that we can use to plan and classify instructional objectives. As introduced in Chapter 2, the affective taxonomy is developmental: attitudes seem to develop through several identifiable stages, and a person cannot reach a level of attitude development without going through the level below it. Levels of the affective taxonomy are identified and described below.

Receiving. The first step in any teaching effort is to get the students to receive, that is, to pay attention or listen to what is being presented. Awareness of what is being communicated is the issue at this level. Willing attention is a logical follow-on to awareness, with selective attention following that. Selective attention is important because students choose the stimulus they will attend to.

Responding. If learning is to occur, getting students simply to listen to a message is not enough. Once we are sure of being received, we want our students to do something. Responding involves some sort of action or response on the part of the student. At first, the student may respond by merely complying. Later, the student may willingly perform an action and obtain satisfaction from it. Responding behavior at a high level is reflected in what we commonly refer to as "interests," that is, those activities that bring enjoyment.

Valuing. As a person responds, some worth or value may be seen in what is being done. Students may come to accept, prefer, or commit themselves to an object or activity because of its perceived worth or value. When students "value" something, we can also say that they "appreciate it." Commonly used terms associated with valuing are "attitudes" and "appreciations."

Organization. At this level students compare, relate, and synthesize values into their own value system. Conflicts between the new material and the existing value system must be resolved because we cannot hold two strongly opposing values or attitudes at the same time. Hence, this synthesizing step must occur as part of the development of a philosophy of life, which takes place in the next level.

Characterization. At the highest affective level, the student incorporates values into a system and that system now becomes characteristic of the student. These values now are the student; they represent a student's way of life or life style. Behaviors that result from such values are considered typical for a given individual.

Figure 10-1 summarizes the affective taxonomy, its levels of learning, and those activities characteristic of each level.

THE AFFECTIVE TAXONOMY

Highest level

Characterization - To integrate values or value systems into one's style or philosophy of life. Behavior that typifies or characterizes a person.

Organization - To compare, relate, and synthesize values into one's own value system.

Valuing - To accept, prefer, or commit one's self to an object or behavior because of its perceived worth or value. To appreciate.

Responding - To act or comply. To perform an act willingly and to obtain satisfaction from it.

Lowest level

Receiving - To become aware. To attend, willingly or selectively.

Figure 10-1

Lesson Planning for Affective Development

As an example of attitude development, let us take the topic of "lesson planning" and trace the building of a value through the various levels of development within the affective taxonomy. When potential instructors take an instructor training course, a goal is to teach them how to plan a lesson. Lesson planning may be a pretty dry subject to some, and so we have to capture our students' attention and focus it on lesson planning as best we can. Upon attaining that focus, we have made students aware, at the receiving level, that the topic of lesson planning exists.

To further illustrate the point, consider the basic design for lesson planning introduced in Chapter 6, Developing the Teaching Plan. For cognitive reasons we can see that a good attention step can help students focus on the subject and get them ready to learn. Affectively, we stimulated the students to tune in and begin receiving. Recall that "receiving" is the lowest level in the affective taxonomy. Remember, the student must begin receiving before the worth of the topic can even be considered. The other lesson parts have important cognitive and affective consequences as well. These consequences are summarized below:

Lesson Part	Cognitive Consequence	Affective Consequence
• Attention Step	Students focus on subject matter and get ready to learn.	Students are stimulated to be attentive, to begin receiving, and to consider the worth of the topic.
• Motivation	Students know why they should listen.	Students are urged to see the worth of the subject and to respond. They are encouraged to develop an interest in the subject.
• Overview	Students follow more effectively when they see the logical sequence of ideas and methods the lesson will include.	Students are oriented when they have the security of knowing where they are going and how they are to get there.
• Body (Lesson Development)	Students acquire knowledge or gain understanding of the subject.	When support is credible, students see and develop positive attitudes and appreciation.
• Summaries	Students see relationships between main ideas and the essential ideas are summarized.	Students feel confident about lesson content and have a feeling of security and completeness.
• Remotivation	Students realize how the lesson can be put to use.	Students see worth in the lesson and leave with a positive feeling.
• Closure	Students recognize that lesson is over.	Students sense a psychological completeness.

Awareness is not enough, so our next step is to get the students to act on the information. At first, students plan lessons because they are told to do so--simple compliance at the responding level. Willingness to respond emerges and later develops into satisfaction with responding. As students go through lesson planning procedures, some of them will begin to see some worth or value in planning a lesson. A lesson plan helps them clearly state what is to be accomplished. It is a handy outline they can use in giving a presentation. It helps them remember visual aids, stories, and examples. Most students may begin to feel more confident with a lesson plan available. Hence, we have obviously arrived at the valuing level of the affective taxonomy.

As experience increases, the value of lesson planning may be assimilated into the students' value system through the process of organization. This is a phase that a person goes through to fit the new value into their existing structure of values.

At some point in the future someone may say, "Let's do a lesson on a new topic," and the immediate reply will be, "First, we'll have to develop a lesson plan." This positive attitude toward lesson planning now seems to be typical or characteristic of the student. Student behavior can then be generally predicted in terms of the value of lesson planning. The characterization level has been achieved.

Relationship of Affective Domain to Other Domains

Although it is very convenient to think of the cognitive, psychomotor, and affective domains of learning as being separate, in fact they are not. Educators have treated the domains of learning as separate entities to make it easier to conceptualize them. In reality, learning takes place and behavior is affected in more than one domain at the same time.

Consider, for instance, the Air Force specialty of pararescue. This job involves highly dangerous situations where a person may parachute or be lowered by cable from a moving helicopter into a combat situation or to the scene of a natural disaster for the purpose of aiding the stranded or wounded. In what domains of learning do the pararescue specialists operate? Certainly the psychomotor domain is involved: lines must be operated, knots tied, and first aid rendered. Obviously cognitive learning also comes into operation: procedures must be remembered, situations evaluated, and the best courses of action taken. It is not difficult to see that the affective domain is also involved. The mere fact that people would volunteer for such a job tells us something about their feelings about the job and other human beings. They probably operate at the valuing level or even higher. It is clear, then, that learning often takes place in all three domains at the same time. While we separate the domains to plan better for learning and evaluation, it is often impossible to distinguish between them in real life situations.

Affective Objectives Can Be Specified and Measured

Few military or civilian schools have undertaken the task of specifying affective outcomes, planning and developing lessons to account for affective outcomes, or measuring such outcomes. Although little has been done to account formally for changes in student feelings and attitudes, in many cases there is at least an implied concern for these affective changes. Many schools have demonstrated their concern by putting affective goal statements into their curriculum catalogs. These statements, which quite often sound and look good, might be useful as mission statements, but they represent a level of abstraction too high for measurable objective statements. Broad affective statements need to be specific to be measurable.

Consider the following two unmeasurable objectives:

- Students should be stimulated toward reaching their maximum potential as teachers.

- To strengthen those professional values necessary for a full career of dedication and service to their country.

These statements are worthwhile goals, but they are of little value as objectives because they are not measurable. How do we know when students have been stimulated toward their maximum potential as a teacher? How do we know when airmen have strengthened their professional values? The answer, of course, is that we have no effective way of measuring such broadly stated objectives. That does not mean that we should not be concerned about affective outcomes. The problem is that the objectives were not stated so that they could be measured. These value objectives do indicate a concern and an acknowledgement of the importance of affect in education. But the writers of these statements simply do not go far enough to specify a measurable affective objective.

Similarity of Cognitive and Affective Learning Outcomes

If we think for a moment about the schools where we have taught or attended as students, we realize that most schools have specifically stated cognitive objectives. Perhaps some have specified psychomotor objectives as well. Few, however, specify affective objectives. But if we closely examine the purpose for most schools, we will discover that they are also very interested in whether or not their students are:

Conscientious	Empathetic
Receptive	Interested
Willing	Participative
Dependable	Ethical

What are some of the lessons learned from working with the cognitive domain that will help us to get started on writing and measuring affective objectives?

- We will use and build upon the lesson planning concepts that were illustrated earlier in this manual. We will not have to learn new approaches to lesson planning.

- Devices used to measure changes in learning are imperfect. Anyone who has attempted to test understanding or rate skilled performance knows the difficulties involved. The same is true for the affective domain. In the affective domain we will often observe behavior and make judgments or inferences about what the behavior means.

- Many of the assumptions made when working in the cognitive domain will also apply in the affective domain. For instance, we will sample behavior and assume that it is typical of the way students behave. We cannot possibly measure all behavior, so we will use the concept of sampling. Behavior is the primary indicator of what people "feel," just as it is the primary indicator of what people "know." We cannot look inside the brain to determine how a student feels about something any more than we can to determine what is understood.

Consider a brief example of the use of behavior in the affective domain. Joe is a student in one of our classes. While talking to another instructor we might say, "Joe has a bad attitude about this school." Our colleague may respond by asking, "What makes you think so?" The evidence we give for Joe's having a bad attitude will probably sound like this: "Why do I believe that Joe has a bad attitude? Well, it's pretty obvious because he

- comes to class late (or not at all)
- doesn't bring his textbook
- doesn't take notes
- sleeps in class
- stares out of the window

- cleans his fingernails in class
- talks during lectures
- doesn't participate in class discussions
- reads magazines during class

What has happened is that we have sampled Joe's behavior and inferred from it that he has a bad attitude about our school. We frequently reach conclusions about people's attitudes and feelings in this way. How can we possibly know how people feel except through their actions or behavior? We infer how people feel from what they do. We need behavioral indicators of attitude just as we need them in the other domains.

A wide range of techniques for specifying and measuring affective objectives is available. What follows will introduce a few of these techniques.

Stating Affective Objectives

Stating affective learning outcomes is not especially difficult given the complexity of the area we are dealing with. Many of the objectives we have seen or perhaps have already written reflect concern for affect. Consider the following example of a lesson objective and purpose statement:

> The objective of this lesson is for each student to comprehend that overpopulation is detrimental to world development (so that the student may better appreciate the need for population control).

In this example, concern for affect is seen in both the objective and the underlined purpose statement. Not every school requires that purpose statements be written out. It is almost certain, however, that every instructor has some purpose in mind when planning a lesson. Purpose statements answer the question, "Why does the student need to learn this material?" The lesson objective itself deals with what the lesson is about. Purpose statements, whether written or not, very often reflect the instructor's concern for student feelings and attitudes which should result from the lesson. This instructor wants the students to comprehend that overpopulation is detrimental and also wants them to feel that it is detrimental. The use of the word detrimental implies a value judgment about overpopulation. In this case the purpose statement also reflects a concern for affect. A look back at the taxonomy will reveal that appreciation is synonymous with valuing. We have an objective and a purpose statement that reflect affective concern at a specific level within the affective taxonomy. The writer of this objective may not have realized that attitude as well as understanding were under development.

Sampling Changes in Student Feelings

Using another example closer to the classroom, consider the following lesson objective and outline of main teaching points. Notice that the third point is clearly affective.

> The objective of this lesson is for each student to comprehend that classroom examinations play a valuable role in the learning process.

- Comprehend that examinations aid teachers by....

- Comprehend that examinations aid students by....

- Value classroom examinations as learning experiences.

We must now attempt to determine whether students do in fact "value classroom examinations as learning experiences" as stated in this objective. Using the same concepts as were used to measure cognitive learning, we proceed to sample student behavior. Using behavioral terms, we construct samples of behavior that will provide evidence that the students do value classroom examinations. The samples might be listed as follows:

- Value classroom examinations as learning experiences.

    a. Propose using examination feedback to improve performance.

    b. Select use of examinations to improve performance when given the opportunity.

    c. Justify the continued use of classroom examinations to improve performance.

The idea is that if our students do one or more of these three tasks (out of many we could have listed), we will have some evidence that this attitude objective has been achieved. We can see that the same sampling procedures apply in affective lessons as those in cognitive lessons. Of course, the samples that we would require as evidence for learning might not be the ones listed above. We might select others. We might also decide that three is not enough--or too many.

Interpreting and Modifying Criterion Objectives

In the previous examples we looked at a level-of-learning objective, but the same concern for affect may be interpreted in even the simplest criterion objective. Consider the following criterion objective:

> Without the use of references, correctly identify 200 of the 206 bones of a human skeletal model.

At first we may question whether there is anything at all that is affective about this objective. Let us examine it more closely, however. It takes a great deal of time and effort to memorize 206 bones, their Latin names, and to be able to point to each on a human skeleton. The mere fact that people would take on this task indicates that they are probably at the responding level of the taxonomy. Learning the names of these bones reflects at least compliance and possibly even some higher level. The point is that even criterion objectives may reflect implied feelings of a student toward the learning task.

There are minor changes that can be made to criterion objectives that will help us better express our affective intent. Consider the following criterion objective that might be part of an Air Force school curriculum:

> Upon completion of tasks in the school laboratory, replenish supplies to maintain the stock levels specified in the laboratory handbook.

With minor changes we can attempt to account for changes in student attitudes in this straightforward objective. To add this element to the objective, we can add a phrase such as "without supervision."

> Upon completion of tasks in the school laboratory, replenish supplies to maintain the stock levels specified in the laboratory handbook without supervision.

If students meet this objective "without supervision," no one will watch them, pressure them, or remind them to replenish supplies--they must now do it on their own. If students meet such an objective, they are functioning at the responding level of attitude, or perhaps even higher.

Consider another crition objective:

> Upon completion of assigned laboratory tasks, return all tools and equipment to designated storage places.

We might add a different phrase to this objective to account for attitude and end up with:

> Without being told to do so and upon completion of assigned laboratory tasks, return all tools and equipment to designated storage places.

Now the student must do the task without being told. Here again, we are at least at the responding level of attitude development.

There are any number of these changes to criterion objectives that can help us to express affective objectives better. Consider the following list of suggested changes:

- voluntarily takes action to...
- without being told to do...
- without promise of reward...
- without threat of punishment...
- without being reminded...
- on student's own time...
- in spite of social pressure to do otherwise...
- initiates on his or her own...

Notice the last three of these phrases in particular. If students do something on their own time initiates something on their own, or do something in spite of social pressure to do otherwise, these persons are displaying behavior at the valuing level of the taxonomy or perhaps higher.

Stating Purely Affective Objectives

The changes described so far are used when we want to "add on" some affective outcomes, but what if the primary purpose of a lesson is affective or what if the affective outcome is just as important as a cognitive or psychomotor outcome? If the main purpose of a lesson is affective, we should plan and conduct the lesson accordingly. Sometimes, it might be best to have both a cognitive and an affective objective for the same lesson. In either case, we need to know how to write an objective which describes affective outcomes.

If we teach management, we have probably spent time insuring that our students know that it is important for good interpersonal relations to exist between supervisors and subordinates. However, knowing what to do is one thing and being willing to do it is something else. We want to determine whether our students will, in fact, establish good relations between supervisors and subordinates when given the chance. What sort of affective lesson objective could we plan to help express our desired goal?

First, we select the desired level of learning from the affective taxonomy and state the lesson objective using that level. We might choose the responding level and begin with the following lesson objective:

> The objective of this lesson is for each student to respond to the desirability of having good interpersonal relations between supervisors and their subordinates.

As with a cognitive lesson plan, we must outline the main points we want to teach in support of our lesson objective. In this instance we will select a main point at the responding level of learning as indicated by the lesson objective. The first main point (M.P.) might look like this:

> M.P. 1 - Respond during guided discussion to the importance of effective supervisor/subordinate communications.

This main point also points toward a teaching method, guided discussion. Here we will use the discussion for something other than a cognitive purpose.

As in previous examples, the next step is to write several samples of behavior using behavioral terms. The following samples might be appropriate in this situation:

a. Present arguments to support the desirability of open communications between supervisors and subordinates.

b. Voluntarily tell personal experiences which illustrate problems which arise from a lack of good supervisor/subordinate communication.

c. Select organizational designs which emphasize interaction between supervisors and subordinates over those which do not.

Putting the objective, the first main point, and the samples of behavior together, we end up with the following plan:

The objective of this lesson is for each student to respond to the desirability of having good interpersonal relations between supervisors and their subordinates.

M.P. 1 - Respond during class discussion to the importance of effective supervisor/subordinate communications.

a. Present arguments to support the desirability of open communication between supervisors and subordinates.

b. Voluntarily tell personal experiences which illustrate problems which arise from a lack of good supervisor/subordinate communication.

c. Select organizational designs which emphasize interaction between supervisors and subordinates over those which do not.

Of course we would continue this process for subsequent main points and samples. Notice that in this lesson plan, we deal primarily with the affective domain and that the major purpose of the lesson is to get students to respond positively to our topic. At the same time, we provide built-in evaluation criteria which tells whether or not we have met the objective.

Measuring Changes in Student Attitudes

Let us look again at the samples of behavior in the previous examples. These samples actually form a small attitude assessment instrument--an attitude scale. The behaviors students exhibit in the samples will tell us something very specific about their attitude toward the task. Such evidence gives us some indication that the affective objective was met. In measuring attitudes we cannot be concerned with hair-splitting measurements. We are primarily concerned with general tendencies and whether these tendencies are positive or negative. Keep in mind too that we should not be satisfied with a measure of just one sample of behavior by itself, because of the broad range of possible behaviors. We run a big risk of misinterpreting if we use only one or two samples of behavior since attitudes are so very complex. We must always be sure to use several samples in an important attitude measurement so that we can have confidence in the resulting decision.

Using Published Attitude Scales

When we first discussed measuring attitudes, we were probably reminded of some sort of attitude scale or test written by a psychologist. Most of us have taken such tests or filled out such scales at one time or another. Most libraries have copies of the publication, Buro's Mental Measurements Yearbook, which reviews a wide variety of commercially available scales and inventories. Scales can measure attitudes toward such items as teachers, education, politics, student ratings, self, study habits, and many more. If we find a scale in Buro which measures what we are interested in, such a scale may be useful and save time in developing one of our own.

If we are faced with measuring the attitudes of a large group of people, a commercially published attitude scale may be just what we need. If we go back to the level of learning example just used and its accompanying samples of behavior, we can see that to determine whether or not students can perform each of those samples without a written test would require close observation during the learning process. If we had a large group of students, we might find it difficult to observe and record the necessary responses accurately and objectively. When we are tasked with measuring the attitudes of a large group of people, some sort of written instrument will probably be most accurate, efficient, and reasonable to use.

We might find the following affective criterion objective for these commercially available scales to be of value:

> Given the (name of the scale) attitude scale, show a statistically significant gain in (whatever the scale measures) on the post-test as compared to a pre-test.

Making Our Own Attitude Assessment Scale

As useful as the published attitude assessment instruments may be, the one we need may not be available in print. In such cases we might write our own. But constructing a scale to measure attitudes and feelings is not an easy task. The complexity of human behavior makes us appreciate the difficulty of accurately measuring changes in attitudes. Whether instructor-made evaluation instruments can accurately and consistently record changes in student attitudes is questionable. But these instruments can be of value and are better than nothing. To the instructor using self-made attitude assessment devices, some words of caution: use the results carefully and do not generalize results to a large population. Use data primarily for your own information. With those reservations in mind, we can approach the process of developing attitude assessment scales.

Pre/Post-Test Design

Probably the most widely used strategy in affective measurement is the pre/post-test design. In this design, student's attitudes are measured at one point in time to determine their attitudes prior to instruction. Students are then exposed to some sort of intervening learning experience. After the intervening activity, attitudes are again measured and the results compared to those obtained in the pre-test. What we want to measure is a change of attitude and its direction (positive or negative). The diagram below illustrates the pre/post design.

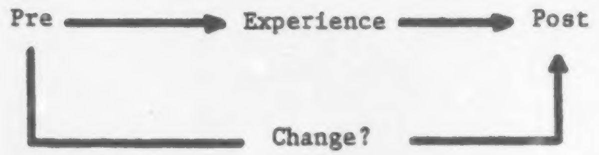


Figure 10-2

We will now address the issue of the specific item types to use in the pre/post design. There are many formats that can be used for this purpose. Some examples follow:

Word List Format

Suppose we were interested in the attitudes of Air Force middle management personnel toward a new management technique. One way to begin would be to survey these managers and ask them, at random, to list words that describe other management techniques they know. These techniques would include techniques with which they have been both successful and unsuccessful. With the words obtained we could develop a master list of both positive and negative adjectives such as effective, efficient, and logical.

Assume that we then have a group of managers in our course who have never used a particular management technique. Further assume that we are interested in finding out what happens to the attitudes of these managers as a result of attending our school and learning this new technique. Our attitude test could be conducted as follows:

1. Administer a pre-test word list to the managers who had not used the technique before coming to our school. The word list might look like this:

Circle 10 of the words listed below that best describe your reaction to management technique "A."

Rational
Helpful
Inefficient
Stable
Traditional
Ineffective
Rewarding
Workable

Efficient
Bothersome
Irrational
Effective
Volatile
Modern
Hindrance
Unworkable

2. Teach the managers the concepts and principles behind the new technique and give them the opportunity to apply it successfully to relevant situations.

3. Readminister the word list following the course.

The idea is that once the managers actually learn and use the new technique in the school setting, their attitudes should change toward the positive. If we are successful, they will likely conclude that the new technique is of real value to them as managers. Therefore, when the word list is readministered, the number of positive words selected should increase. We can construct a criterion objective for this pre/post situation which would look like this:

Given a list of mixed (positive and negative) adjectives used to describe a technique of management, select 10 which include more positive connotations on a post-test as compared to a pre-test.

Multiple-Choice Format

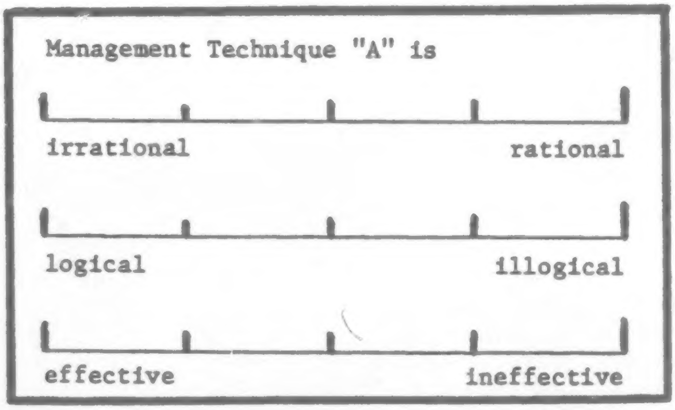
A multiple-choice question for measuring the affective domain will have no right or wrong answer. Rather, it will permit students to express, in a structured way, their feelings about a topic.

I find the subject of (fill in)

a. very interesting
b. somewhat interesting
c. somewhat uninteresting
d. very uninteresting

Bipolar Scale Format

The bipolar format is simply a variation of the word list technique. In this format the person taking the test is not required to select single words, but instead is asked to rate something along a line between two extremes. This format could also be used to measure attitudes about the new management technique used in the earlier example. The major difference from the word list format is that the managers would now be given the opportunity to indicate their feelings at some point along a line between two extremes. For example, instead of making the adjective "irrational" an option, we might put the word "irrational" at one end of a continuum and the word "rational" at the other end. A portion of a possible bipolar scale is shown below:



In this example the respondents would place an "X" or check mark at some point on each line. The various points could be given values that would enable us to calculate total or average scale scores permitting pre/post comparisons. Note that the values of the qualities are purposely mixed, with positive and negative terms on both sides, forcing the student to think about the responses. The bipolar scale is an excellent device to use when your lesson involves a concept or concepts as described in Chapter 8.

Measuring Attitude Changes Following the Experience

Sometimes it is impossible to give an attitude test during both a pre- and post-test. In certain situations there is only one chance to measure a student's attitude. The bipolar scale just discussed can be used as a one-time measure. Another example would be an end-of-course critique. On such critiques, students indicate how they feel about various aspects of the experience. For example, we might give the students a set of instructions and a scale and ask them to rate a series of curriculum topics such as methodology, communication skills, or evaluation:

I believe that the performance of this school in the tasks described below has been:

A	B	C	D	E
Outstanding	Excellent	Good	Fair	Unsatisfactory

We could further break down the major areas into topics to get more specific feedback. For example, under the major curriculum area of communication skills we might ask students to rate statements in the following two examples using the same 5-point scale (A, B, C, D, E):

The degree to which the curriculum:

- prepared me to organize and prepare lessons which will ensure clarity and effectiveness in communication.
- prepared me to listen more effectively to others.

Most end-of-course critiques obtain responses to questions like those listed above but do not use results to determine whether an attitude objective has been reached. We could also write a school criterion objective that would set a goal for how well we are meeting student needs. An example of such an objective follows:

> Given a series of curriculum topics and a related rating scale, rate at least 80 percent of the topic areas average or higher.

In this instance we have decided that if the students at our school rate 80 percent of the areas we ask about as average or higher, we will be satisfied that our students have positive feelings about our school to a degree we find acceptable.

Likert-type Scale

Another approach to post-test only or pre-post-evaluation is the Likert-type scale. Students respond to clearly favorable or unfavorable statements by selecting one of the following responses: strongly agree, agree, no opinion, disagree, or strongly disagree. This approach is useful for measuring attitudes toward concepts or principles as described in Chapter 8. The Likert-type scale is relatively easy to quantify by assigning numeric values to each point on the scale. For example, we might assign a 5, 4, 3, 2, or 1 respectively from the strongly agree to strongly disagree end of the scale.

Either/Or Format

This simple format gives the student a choice of expressing an attitude by selecting either one alternative over another. For example:

If I had it to do all over again, I (would/would not) have taken this course.

Open-Ended Question Format

Sometimes we have to permit our respondents to express themselves in a somewhat less structured way than those already mentioned. The open-ended question can help us in this regard. This format structures what is asked, but allows freedom of response. Some examples of the open-ended question follow:

If I were teaching this class, I would....

If I caught a student cheating, I would....

The major drawback to this format is that the responses must be read and interpreted, making it very difficult to code and quantify data.

Dealing With the Higher Affective Levels

Written scales and tests like these are useful when measuring the lower affective levels, especially in changes in attitudes over short periods of time. Short courses and brief exposure to material can be expected to change attitudes very little and only at the lower affective levels (receiving, responding, and, possibly, valuing). Changes at the higher affective levels (valuing, organization, and characterization) require much longer exposures, a block of instruction or an entire course rather than a lesson, and are more difficult to measure. We cannot be sure a particular attitude characterizes a person when our only measure or index is a paper and pencil test or scale. It is very difficult to measure the higher affective levels at all, much less with paper and pencil tests.

The methods for measuring higher affective levels are not objective or precise, but it is possible to measure the higher levels. The best way to get evidence of this level of attitude is to place students in specific situations for a long period of time and then observe their behavior for indicators of attitude. For example, if we are interested in determining if some value or attitude "characterizes" our students, we might have them role-play in a realistic situation. Observing their role-playing can tell something about student attitudes. Similar situations might include case studies, games, simulations, and class projects. Each of these situations provides an opportunity to observe a student under realistic conditions. Short experiences which do not get students to act out or somehow show their real attitude are of no particular value at the higher attitude levels.

Which Affective Measure Should Be Used?

Which techniques for measuring attitude change, we may wonder, should be used in our own teaching. Unfortunately, there is no easy answer to the question, just as there is no easy answer to which measurement techniques we should use to measure knowledge or skills. Many methods and techniques adequately measure attitude, just as many methods and techniques measure other learning. Who decides whether to use true-false, matching, multiple-choice, or essay items at a particular school? The faculty members, curriculum advisor, or commandant? The same person might also make similar decisions with regard to attitude measures. Someone must decide which techniques would be most appropriate and practical for the particular situation.

SUMMARY

Writing and measuring affective objectives is an important but difficult task. In many ways, we have more difficulty specifying and measuring attitudes than we do for any other type of learning. We are forced to accept indicators of behavior which are second hand evidence of student attitudes. Our measurement devices are often inconsistent and occasionally marred by error. But we do have attitudinal objectives, and our difficulties in writing and measuring them should not keep us from making attitude development a critical part of our courses.

SECTION C

INSTRUCTIONAL METHODS AND MEDIA

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While the academic instructor has a wide variety of methods available, Section C focuses on several of the most valuable:

Teaching Lecture
Guided Discussion
Case Study Method
Teaching Interview
Demonstration-Performance

The Selection of Teaching Methods chapter presents other methods in less detail. In addition, the questioning chapter focuses on the skills of classroom questioning which are fundamental to nearly all methods of instruction.

Chapter 11

USING QUESTIONS FOR LEARNING

Questions are so much a part of teaching that they are often taken for granted. Many professionals, such as lawyers and doctors, are taught how to ask questions, but few instructors receive formal training in questioning skills. This lack of training, coupled with the average instructor's lack of planning for questions, often results in ineffective or inefficient use of questions. But it doesn't have to be that way.

Why should we care about questions? Because the effective use of questions may result in more student learning than any other single technique we use as instructors. A considerable amount of classroom communication is in the form of questions. Questions play a key role in most teaching methods. Thus, it is important for us to learn to use questions correctly.

In this chapter we will begin by comparing questions at the knowledge and comprehension levels to show that the level of learning is always the starting point in formulating questions. Having determined the overall format, we will see that questions are categorized by purpose to help us plan to reach our objective. Next, we will see that questions are categorized by direction to ensure that all students are involved in the process and reach the appropriate level of learning. Finally, we will discuss some common problems associated with the use of questions and some techniques that can be effectively used in overcoming these problems.

THE STARTING POINT

In order to understand that the level of learning expressed in the lesson objective is the starting point in designing questions, let us compare the first two levels of learning in Bloom's taxonomy. We know that at the knowledge level, the goal for our students is to recall specific information. The process of critical thinking begins with data or facts, and recall questions, therefore, are a necessary beginning. Recall questions help guide the students to the higher intellectual processes of thinking. During the lesson we want our students to remember factual information and to repeat what they have learned. What kinds of questions should we ask during the class session to produce this behavior? Knowledge level questions are usually characterized by such words as who, what, when, where, and which. For example, "Which presidents of the U.S. had military service before their election?" Students either know the answer to this question or they don't.

There are many legitimate reasons for asking knowledge level questions. In a demonstration performance lesson you may want to determine if the students have been able to keep up with your explanation. In an informal lecture you may want to determine if the students have the background information necessary for the class to proceed. Perhaps you want to determine if the students can recall basic principles and generalizations before you begin your more in-depth discussion of them.

There is a danger in asking only these kinds of low level questions. Simply because your students can parrot back what you said in class or what they have read does not necessarily mean that they understand the material. If we ask solely knowledge level questions, we run the risk of slighting other intellectual processes of our students. If we want our students to engage in more than just memory work, then more work in formulating questions is required from us.

At the comprehension level of learning the emphasis is on understanding, rather than mere recall. We want our students to grasp concepts, to explain similarities and differences and to infer cause-and-effect relationships. To achieve these results we should ask open-ended questions that are thought provoking and require more mental activity than simply remembering facts. For instance, questions containing the word "how" allow the students to compare and contrast; "why" questions encourage the students to question the causes of events or actions; "What if. . ." questions prompt the students to predict. For example, "With all the emphasis put on safety in the Air Force, why do accidents continue to be such a problem?" Notice that students must expend greater effort to answer this question than they did to answer the simple recall question of which presidents had military service.

In many Air Force classes, instructors must bring their students beyond the comprehension level to a position where they can use what they have learned to solve Air Force problems. Most of what we say about questioning at the comprehension level holds true for the higher levels of learning. Even though the remainder of this chapter addresses the comprehension level, it also applies to the higher levels.

DETERMINE PURPOSE

Questions serve a variety of purposes. A good question posed by the instructor can command the students' immediate attention. Properly planned and asked questions will stimulate student thinking. Questions can give you a chance to see how effective your teaching has been.

One of the most important purposes of questioning is to develop the subject of the lesson. In a guided discussion, case study, or informal lecture the subject would be developed through questions fostering student participation. In a teaching interview development would occur through questions directed toward the guest.

Regardless of the method, if your purpose is to start participants talking, plan a lead-off question that will generate discussion. Your lead-off question should stimulate thinking and be phrased so that participants are aware of the main point. For instance, a guided discussion on the topic of time management might have as a main point "Effective management begins with proper time managememt." The discussion might be initiated with a lead-off question such as "Why is there a need for all of us to manage our time properly?"

Once you have initiated the lesson with a lead-off question, your purpose is to guide the direction of the discussion. Plan follow-up questions that are designed to guide the lesson progression by supplying sub-ideas. Your follow-up questions should be such that they promote reasoning. In the same discussion on time management, an appropriate follow-up question might be "How do we mismanage our time?" Notice how the instructor's question has provided a sub-idea, i.e., mismanagement of time. The students will now consider this aspect of the issue and relate it to the main point.

Once your lesson is in progress, you may notice that one of the students is starting to get sidetracked. At this time you can ask a spontaneous question to lead the straying student back to the main point. A spontaneous question can control the content of the lesson by insuring that responses are pertinent. A spontaneous question can be used to seek clarification. For instance, in a teaching interview, if the guest gives a response that is not clear, you could prompt the guest by asking for an explanation or an expansion through such questions as "Would you restate your answer in another way?", "What else can you add?", or "Are there other reasons?"

Spontaneous questions are also used to seek support when a statement is made that appears to be shallow, lacks focus, or merely parrots information from a text or previous lecture. You need examples or statistics as support for the assertions just made in order to promote understanding. Hinting or further prompting from you may be necessary before the lesson can move on. For example, in an informal lecture on the strategy of deterrence, you might ask, "How would a countervalue strategy affect the free world order of battle?" If the students were unable to reply, you could ask for a definition of countervalue at the know level. With that answer in mind, you could then provide a hint such as, "Opposed to a countervalue strategy is a counterforce strategy. How would the targets differ?"

QUESTIONS CATEGORIZED BY DIRECTION

Once you have determined the purpose of a particular question, you are ready to actually ask the question. Your first decision should be your target: Who do you want to respond?

Directed to Entire Group

An overhead question is directed to the entire group rather than to a specific individual and is one to which you expect an answer. Overhead questions work well in stimulating thinking and getting participation started. Lead-off questions are often overhead questions since they are usually addressed to the class rather than one person. Overhead questions of this kind alert all members of the class and keep them following the discussion.

Instructors frequently ask questions for which no answer is expected. These are rhetorical questions because they are either answered by the instructor or are left unanswered. Why would an instructor ask questions for which no answer is expected? Such questions can be found throughout a lesson, from the attention step to the conclusion. "Have you ever wondered why. . .?" can be an arresting opening. "What could Capt Jones have done to prevent. . .?" could motivate students by putting them mentally into a specific situation. "What do you think the Inspector

General's recommendation might have been. . .?" could lead into an overview of the lesson.

As the instructor nears the end of a lesson, there are also many ways rhetorical questions can be useful. The summary often begins with something like "Well, what have we learned about NCO responsibilities today?" In an interim summary it is very natural to say "What have we learned so far?" As we remotivate students we might say "If you faced the same situation as Capt Jones, do you see where this approach would have worked?" Even in the concluding statement we might find such questions as "What will you do the next time a traffic fatality is reported in your squadron?" Or "Based on what we have observed today, what would you recommend to the new wing commander?"

Directed to Individuals

Many times during a class session, the instructor will find it necessary to direct a question to a specific individual. A direct question, as its name implies, is addressed to a particular person to elicit involvement, to seek an opinion, or to draw out support. For example, "Sgt Lopez, you've taught for awhile. How have you handled individual differences in your classroom?"

When a student asks you a question, you may prefer not to answer it because you want the other students to continue to think and discuss. Here you might ask a reverse question, one that asks the same student the same question. Lt Michaels might say to you, "I really can't see your point. Why is it necessary to have authoritarian leaders?" You could reverse the question back to the same person by saying, "Think about it for a minute, Lt Michaels. Why do you think it would be necessary to have an authoritarian leader, say, in a combat situation?"

Similarly, if a student asks you a question and if, again, you prefer not to answer it, you may choose to redirect the question to another student. This relay question will help keep the discussion among the students. Ms. Cannon might ask, "But how does an authoritarian leader fit into the modern Air Force?" Your reply could be, "Your question is one we ought to consider. Airman Cook, how would an authoritarian leader fit into today's Air Force?" A relay question, then, is one in which Student A asks a question of the instructor and the instructor passes it on to Student B.

EFFECTIVE QUESTIONING TECHNIQUES

Now that we have discussed the factors involved in planning and selecting comprehension level questions, the real challenge is in the doing, in asking the questions. Even the right type of question can be carelessly asked. In this last section let us assume that you have one overall problem at this time in your class: No one is saying anything! (Or they are saying the wrong thing.) What are some of the things that you can do to avoid this situation?

Avoid Do-Nothing Questions

Your first course of action can be to avoid questions that do nothing to promote thought and discussion. If not carefully planned, questions can be too simple or too complex. We should avoid the kinds of questions that actually limit the discussion.

The first category to avoid is dead-end questions. For instance, a question that requires no more than a yes-or-no response is really a dead-end question. If you asked your students, "Is Colonel Doaks an example of a democratic leader?" as a lead-off question, what would they discuss? This kind of question does not promote discussion; it encourages guessing and can be a waste of time. If you find that you must ask a yes-or-no question, be sure to follow it up by asking "how" or "why," in order to get the students to explain their answers and have something to discuss.

A second category of do-nothing questions is foggy questions. As the name implies, foggy questions are unclear or nebulous, usually because the instructor has not thought through the desired answer. Foggy questions are often ambiguous, such as "What happened in Cleveland in 1873?" Students will not understand what is wanted or what the teacher is suggesting. Indefinite questions are also unclear because they are not limited. "How do a manager and a staff member differ?" is a foggy question because the students have not been provided any focus.

Multiple questions are another example of this category. Students become confused when you ask double and triple barrelled questions, such as "What are some of the Federal laws passed by Congress in support of education, and what have they accomplished, if anything?" This double barrelled question is confusing because the students will not know which part the teacher wants answered first. As a result, they may just sit there with puzzled looks on their faces.

The last category of do-nothing questions to avoid is the catch question--where you already know the answer and imply it in the question. Some kinds of leading questions fall in this category, such as "Now, this is the first step, isn't it?" Because the question implies the expected answer, it prevents the students from reaching their own conclusions. Oftentimes they elicit no more than a yes-or-no answer or a nod of the head, and therefore generate very little discussion.

Loaded questions are another example of catch questions. "Have you quit pressuring your subordinates?" is a loaded question because no matter what the student says, it could be wrong. Loaded questions should be avoided because they reflect the bias of the teacher.

Avoid Stifling the Discussion

If you find that despite the nature of your questions the students still are not talking, perhaps you are somehow hampering the flow of discussion. You can avoid stifling the discussion. First, allow enough time for students to think and respond. Waiting for an answer is perhaps the most difficult task for an inexperienced instructor who is intimidated or threatened by moments of silence. Too many rapid fire questions will not allow for thought, and you may be encouraging short responses and therefore little discussion. Patience is necessary. Allowing enough time is especially critical after the lead-off question. You might indicate to your student that you do not want an immediate answer. Say something like "I want you to think about this for a minute before answering" and then ask the question. This tactic

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tends to discourage aggressive, hand waving students and gives the quieter ones a chance to think and then respond.

To compensate for the fact that students may not be responding, impatient instructors may sometimes feel tempted to provide the information themselves. Avoid this habit. Don't answer your own questions. This habit can be very annoying. It increases the amount of teacher talk and minimizes the amount of student participation. Students will learn quickly that it is not necessary for them to prepare for class, because "the teacher answers all the questions anyhow." Also, try to allow for more than one student response per question. Don't rush the responses; give the students a chance to explain. Rushing responses inhibits students and tends to stifle the discussion.

Be Clear and Concise

Human energy can be extravagantly wasted when we persist in trying to answer questions that are vague and meaningless. How often have you sat in class and listened to the instructor ask a question, for which your response was "Huh?" The wording of your questions is very important, especially to avoid smart-aleck remarks: to the question, "When do you use Boyle's law?" the answer might come, "Never. I don't even know the man." Think through the relationships that you are trying to teach, and then plan clear and concise questions. If you rephrase or ask your questions several times, the students may become very confused and unable to discuss your material.

Show Concern for Individual Differences

This last technique for asking effective questions pertains more to your presence in the classroom and your acceptance of the students. If there is little discussion, perhaps it is because you are not showing concern for your students. Rather than allowing one student to dominate the conversation, encourage all students to participate. If you make it a practice to call on nonvolunteers, everyone soon gets the idea that they are responsible for participating. If you encounter reticent students, who are quiet and do not say much, be tactful in drawing them out. Probably the least effective approach is to surprise the student with "John, what do you think about this point?" Often simple eye contact and a smile will encourage a response, rather than a direct confrontation by name. Reasons for the reticence may be varied. The student may not be prepared, may feel ill at ease in the group, or may simply be thoughtful. If a topic is new, challenging, or complex, some students may need more time than others in getting into it. Often a low participant at the beginning of a class becomes a high participant later on as the issues become clearer.

When considering individual differences, be sure that you don't embarrass your students. If someone has been inattentive, alert that person by name and choose a question that you think that person can handle. Perhaps ask a recall question initially, rather than a complex question, to get that person's attention and involvement. Make all the students feel that they have a share in the class.

Finally, be accepting of your students and their responses. Student answers should be genuinely sought. Be aware that mannerisms as well as words can turn people off. Your body language, facial expressions, and tone of voice all play a part in encouraging or discouraging students to participate. Be careful not to cut someone off too quickly. Even though an answer may sound inappropriate, if the student is given a chance to explain, part of the answer may be correct. Even if the answers are not "correct," they may provide valuable clues to student difficulties and provide a basis for reteaching. Criticism from you at this point might cause withdrawal from participation. When students ask you questions that are not pertinent, tactfully defer the answer until later in the lesson or arrange to discuss the issue later.

If you adopt such suggestions, your students are likely to realize that you are concerned about them and will be more willing and able to discuss the material.

SUMMARY

Questioning is an important means of producing mental activity in students. It is possible to reach a specific level of learning by designing questions to elicit the responses necessary for support. Learning at the comprehension level and beyond will require more than responses to who, what, where, which, and when questions. Determining the purpose of a question will also help to reach a given level of learning. The lead-off question initiates the discussion; the follow-up question guides discussion; and the spontaneous question controls and supports the discussion. Questions can be directed to the entire group or to specific individuals, depending on whether you are trying to motivate the students, get them involved, or keep the discussion going. Planning questions to include everyone will help insure that all students reach the objective. Promote a lively discussion by avoiding questions that do not stimulate thought, by wording the questions so that students understand what is being asked, and by being considerate of the individuals in the group.

Questions are used for many purposes, but they should always develop the lesson's central theme or thought. If the objectives of the lesson are clearly determined in advance, instructors will find it much easier to handle questions and keep the discussion moving in the planned direction.

Chapter 12

SURVEY OF TEACHING METHODS

Introduction

Which is more important--what you teach or the way you teach? The payload or the delivery vehicle? Obviously, both are critical. Good objectives are wasted on poor teaching methods. Good teaching methods aid learning but have little value if course objectives are poor. Most of the previous chapters have been concerned with design. This chapter and the several which follow discuss the many ways to deliver instruction--the teaching methods.

After determining the lesson objective, the instructor should choose a method of instruction, not in terms of instructor activities but in terms of the student's activities as a learner. In making a decision, the instructor considers the ways that people learn: by doing, by discussing, by listening, by observing, and by participating. The instructor's role is to select an organized set of activities that will result in meaningful learning experiences for the students.

This chapter is a survey of many popular teaching methods. Although the descriptions are short, there should be enough detail to identify those methods which deserve further study. Five methods of teaching are described in considerable detail in subsequent chapters. These are: lecture, guided discussion, teaching interview, case study, and the demonstration-performance methods. These five have been selected for expanded treatment because of their applicability to Air Force classroom instruction.

For the sake of clarity, the individual methods described in this chapter have been grouped into broad, major categories. Examples of each category are included since no one particular method is suitable for all teaching situations. If, for example, students are to gain skill in performing a certain task, one of their activities should be practice in performing the task. If the desired outcome is knowledge, students probably should observe and listen so they can relate what is seen and heard to their own experiences. If students must learn to apply a principle, the instructor might ask them to solve a problem or perform some task requiring an application of that principle.

I. PRESENTATIONAL METHODS

The presentational methods provide situations in which the skill or material to be learned is in some way presented to or demonstrated for the learner. In some presentational methods there is little if any activity or interaction required of students other than their attention and desire to learn. In other instances there is considerable student activity involved. What distinguishes these methods from the other categories is that students begin the learning experience with little or no previous exposure to the material or skills to be learned.

A. Lecture Method. The teaching lecture is a formal or informal presentation of information, concepts, or principles by a single individual.

1. The formal lecture is usually given to large groups with no active participation by the student. The

learning experience is essentially passive.

2. In the informal lecture, the size of the group is usually smaller than the formal lecture, and active student participation develops when the instructor questions the students or they question the instructor on points presented.

3. A briefing is a formal or informal presentation in which a variety of significant facts is presented as concisely as possible. The briefing is rarely concerned with material beyond the knowledge level and is almost always accompanied by visual representation of the material in the form of charts, graphs, slides, and other aids. Strictly speaking, the briefing is not a teaching method, but it is sometimes used in school situations.

4. A guest lecture is a presentation by a person other than the instructor who is usually an expert. It is used to give variety to the class period or to supply information in an area where the instructor is not an expert.

B. Indirect Methods of Discourse. Indirect discourse involves verbal interaction among two or more persons which is seen and heard by students. Some examples include:

1. A dialogue is interaction between two or more persons, one of whom may be the instructor, generally to present sharply opposing points of view for students. The dialogue is often highly structured towards preplanned goals and may take the form of questions and answers between the participants.

2. Teaching Interview Method. In a teaching interview, the instructor questions a visiting expert and follows a highly structured plan which leads to educational objectives. The advantage of the teaching interview over the guest lecture is that the instructor controls the expert's presentation. The expert normally requires little or no advance preparation, but responds impromptu from general experience. When a question and answer period follows the interview, students can interact with the expert.

3. A panel is a structured or unstructured discussion between two or more experts (generally excluding the regular instructor), presented in a variety of ways such as constructive arguments followed by debate, response to questions from the instructor or the students, a pre-planned agenda, a fixed or a random order of speakers, or free discussion.

4. Skits, playlets, and other dramatizations are often effective means of introducing variety into instruction and of reaching objectives directly or indirectly. A sub-division of dramatization is role-playing by an instructor to point out good or bad examples. Role-playing by the instructor differs from role-playing by students--a simulation method.

C. Demonstration-Performance Method. The demonstration-performance is the presentation or portrayal of a sequence of events to show a procedure, a technique, or an operation, frequently combining oral explanation with the operation or handling of systems, equipment or material. The demonstration-performance is the most commonly used small group learning experience in a classroom or laboratory (which requires significant instructor intervention) to develop learner skills in the operation of equipment or the acquisition of mental skills.

1. Coaching is an intensive learning experience for individual or small groups, characterized by significant student involvement and immediate instructor feedback. A videotape of student performance is an excellent teaching aid when supplemented by an instructor's analysis and critique. This technique is particularly effective in instructor training.

2. Tutoring is an informal, student-centered activity generally involving instructor and learner in a one-to-one relationship, often for remedial reasons or for learners with special needs.

D. Reading is the assignment to a student of printed verbal materials including books, periodicals, microforms, manuals and regulations, and handouts (instructor-produced).

E. Self-Paced Methods. Self-paced instruction is a learning program which is organized so that students are allowed to move through it at their own pace under the guidance of an instructor. Some typical applications:

1. Programmed instruction is a method of instruction which usually includes a carefully planend sequence of small units of instruction which require the learner to respond to cues and receive immediate feedback. Various media (books, teaching machines, and computers) are used to deliver the programmed instruction to the learner.

2. Modular instruction contains pre-packaged units of instruction which typically contain a clear statement of objectives and all necessary learning resources to permit the learner to achieve these objectives. A module can be a complete unit or part of a course.

3. Computer-assisted instruction is a learning experience which uses a computer as the vehicle for interaction between the learner and the planned course of instruction.

4. Mediated instruction includes such devices as slides, films, tapes, and cassettes used to present the planned course of instruction to the learner.

II. STUDENT VERBAL INTERACTION METHODS

Verbal interaction methods, as the designation implies, present situations in which students interact verbally with an instructor, a group leader, or with each other. Learning is enhanced as students deal with the material as a group. Their methods presuppose a certain amount of previous preparation by the students.

A. Questioning Method. Questioning as a method is used to emphasize a point, stimulate thinking, keep students alert, check understanding, review material, and seek clarification. See Chapter 11. Examples of this method are

1. Socratic Method. While rarely seen in its pure form, instruction by asking students questions is a method as old as ancient Greece and as modern as a Great Books course. The method may resemble a guided discussion, but the goal is often to obtain specific answers to specific questions (reiteration) and not to stimulate discussion. An instructor may use the method for "trapping" students into logical inconsistencies which sharpen their thinking skills. Law professors often use the method for "interrogating" specific students using a series of questions as they might be used in a court of law.

2. Student Query. "Students asking questions" is often used in combination with other methods such as the lecture, the panel discussion, or the teaching interview, but it could be used by itself, either on a one-to-one basis in tutoring or coaching or as part of small or large groups. The method is student controlled, although the responder can also control the session to a certain extent if skillful enough. Students' questions may often be a measure of the degree of their understanding of a particular matter, i.e., they "know enough to ask the right questions."

B. Non-Directed Discussion Method. Non-directed discussion is a group interactive process in which task or objective-related information and experiences are evoked from the student. The instructor normally plays a very limited or passive role. For example:

1. In its original form, the peer-controlled seminar is a group of highly qualified peers (such as a doctoral-level faculty) who meet periodically for the exchange of ideas, usually in the form of prepared papers with discussion or questions following. The research seminar resembles a peer-controlled seminar when the instructor allows qualified students to lead the discussion with the instructor providing proper supervision. In professional military education, a peer often acts as a "facilitator" to lead discussions or conduct workshops. When used, the instructor should provide a statement of the educational objectives, a suggested discussion guide, and should require some tangible evidence of the results of the discussion.

2. Akin to the "bull session" or the "war story" hour, free discussion can be a valuable adjunct to participatory management or brainstorming, but, by its very nature, it seldom supports measurable objectives.

C. Guided Discussion Method. The guided discussion is an instructor-controlled, interactive process of sharing information and experiences related to achieving an educational objective. The difference between non-directed discussion and guided discussion is the active involvement of the instructor in asking questions and summarizing the concepts and principles learned. The instructor interacts with the group as a whole through questions, but tries not to dominate the discussion. Students are encouraged to learn about a subject by actively sharing ideas, knowledge, and opinions. The flow of communication is a transaction among all the students rather than question and response between individual students and the instructor. The method employs inductive learning to help students form generalizations.

III. APPLICATION METHODS

Application methods provide learners with opportunities to apply previously learned material in situations calling for the practical use of the material. Some application methods require students to relate material already learned to new experiences and mentally recognize how the material applies, that is, to transfer concepts to new situations. Other application methods require students to apply previously learned materials to new situations for the purpose of making decisions or solving problems.

A. Individual Projects. In all practical exercises, students interact with things, data, or persons, as necessary, to attain training objectives. Student projects usually take place outside the classroom setting, but not necessarily. An important aspect is instructor feedback, which is given periodically as needed. Some examples of the uses of this method are research papers, staff instruments, theses, dissertations, construction or assembly of equipment or models, creative writing, and making of graphics, pictures, displays.

B. Field Trips. A field trip is an out-of-classroom experience where students interact with persons, locations, and materials or equipment for the attainment of instructional objectives. An important aspect of the field trip is the student's encounter with real settings.

C. Simulations. Simulations are low-risk, educational experiences which substitute for some real-life situation. Simulations may involve individuals, groups, or whole units. They may preempt normal classroom time, and they are especially effective as "capstone" methods following a block or several blocks of instruction. More elaborate versions may require special equipment, simulation areas of various sizes and configurations, and specially trained staff. Some kinds of simulations:

1. Role playing requires students to project themselves into a simulated interpersonal situation and play the parts of the persons and situations assigned by the instructor. Role playing is generally limited to practice of the skills involved in interpersonal relations, such as counseling, interviewing, and conference leadership.

2. In-basket exercises simulate a series of matters or decisions in random order that a leader might actually encounter. Students are confronted with a rush situation, limited information, and a list of action-demanding items which actually might be found jumbled in an in-basket. After sorting out priorities, students dispose of matters by delegating, replying by mail, setting up meetings, delaying action, and deciding who should do some of the urgent actions (see Campbell, et al., 1970 for a detailed discussion of this method).

3. In organizational or management games, students manipulate an organization or some component part to try to produce certain outcomes. Various degrees of competition between teams of students may be built into these exercises. If they entail any degree of complexity, organizational games almost always employ a computer to carry out the simulation (see Hinricks, 1976).

4. In hardware simulation, students use trainers that resemble to some degree the equipment that is to be used on the job. (A flight simulator, for instance, has some characteristics of an airplane.) Such devices are substituted when using the actual equipment is too costly or otherwise impractical.

D. Case Study Method. The case study is a learning experience in which students encounter a real-life situation in order to achieve some educational objective. By studying realistic cases in the classroom, students develop new insights into the solution of specific on-the-job problems and also acquire knowledge of the latest concepts and principles used in problem solving.

Summary

This chapter has provided a brief overview of several teaching methods grouped under the broad categories of presentational, student verbal interaction, and application. Most familiar methods have been identified here with enough detail to determine whether further study might be worthwhile. Five individual methods will be dealt with in detail in the chapters which follow. A process for selecting teaching methods appropriate to given situations from among those methods described in this chapter is the subject of Chapter 18.

Chapter 13

THE TEACHING LECTURE METHOD

Traditionally, lecturing has been the most popular teaching method in the military. We sometimes lecture to large groups of students in auditoriums for extended periods. Other times we explain a subject or a process briefly and informally in small groups, before proceeding with some other activity or method--a kind of mini-lecture.

TYPES OF LECTURES.

A teaching lecture is a formal or informal presentation of information, concepts, or principles by a single individual. For convenience, we can divide teaching lectures into the following types:

Formal Lecture. Normally communication in a formal lecture is one-sided, from the instructor, with no verbal participation by students. Because it is impersonal, a formal lecture is usually given to a large audience. Even though structured and often rehearsed, the formal lecture should have a natural and conversational delivery style, without overuse of notes.

Informal Lecture. The audience for an informal lecture is usually smaller than for a formal one. Considerable verbal interaction between instructor and student is often possible in the form of both questions and discussion. The delivery style is even more conversational, with students often addressed directly by name. Many Air Force schools with small classes use the informal lecture extensively.

OTHER TYPES OF ORAL PRESENTATIONS

Two other speaking situations common in the Air Force differ from the teaching lecture.

Briefing. The main purpose of the military briefing is to inform rather than to teach. The briefing format or organization is often fixed, with different subjects arranged topically, perhaps in the same order day after day. The briefing often forms the basis for decision making or operations. The formal briefer minimizes self, while effective lecturers often project more personality or humor. The briefer is usually not concerned with such learning techniques as interim summaries, repetition, and extended conclusions. If there is interchange between the briefer and the audience, questions are usually restricted to the material being presented. Although as Air Force teachers we may occasionally present briefings, we should avoid strict briefing style in the classroom.

Speech. A speech generally has one of three basic purposes: to inform, to persuade, or to entertain. The informative speech is a narration concerning a specific topic, but does not involve a sustained effort to teach. The Air Force Speakers Program, orientation talks, or presentations at commander's call are examples of speeches to inform. The persuasive speech is designed to move an audience to belief or action on some topic, product, or other matter. Recruiting speeches to a high school graduating class, budget defenses, and courts martial summations are all primarily speeches to persuade. The entertaining speech gives enjoyment to the audience. The speaker often relies on humor and vivid language as a primary means of entertaining the listeners. A speech at a dining-in is frequently a speech to entertain.

Instructors may at times want to accomplish all three basic purposes of speaking. We often attempt to inform students on a given subject. When we try to influence students to modify their behavior we become persuaders. Finally, it may be advantageous at times to gain attention by entertaining. Still, our primary purpose is to facilitate student learning.

ADVANTAGES AND DISADVANTAGES OF LECTURE METHOD

In many Air Force teaching situations the method of instruction to be used is predetermined, and as instructors we may have a limited role in deciding how the material will be presented. In some cases, however, it may be our job to choose the method to use for a lesson or a series of lessons. We should select the appropriate method only after we write the lesson objective and complete our initial research on the subject. The selection process will be more effective if we are aware of the advantages and disadvantages of the lecture method. While these advantages and disadvantages pertain especially to the formal teaching lecture, most also apply to the informal teaching lecture.

Advantages. Because of its advantages, a majority of Air Force instructors use the lecture method at least part of the time.

a. The lecture is one of the most efficient teaching methods for presenting many facts or ideas in a relatively short time. Material that has been logically organized can be presented concisely in rapid sequence.

b. The lecture is particularly suitable for introducing a subject. To ensure that all students have the necessary background to learn a subject, we can present basic information in a lecture. By using the lecture in this manner, we can offer students with varied backgrounds a common understanding. A brief introductory lecture can give direction and purpose to a demonstration or prepare students for a discussion.

c. The lecture is a convenient method for instructing large groups. If necessary, we can use a public address sytem to ensure that all students can hear us. The lecture is sometimes the only efficient method to use if student/faculty ratio is high.

d. The lecture is often useful to supplement material from other sources or for information difficult to obtain in other ways. If students do not have time for research or if they do not have access to reference material, the lecture can fill the bill. In subject areas where information is available in widely scattered places (textbooks, journals, tapes), the lecture allows the instructor to summarize and emphasize pertinent material. Reports, current research, and information which changes frequently may not be easily available in written form, and the lecture can give students the most up-to-date information.

e. The lecture allows a large number of students to receive information from real experts in a subject. In general, a person who can speak from actual experience or a scholar who has carefully analyzed the results of research will have great credibility with students. The lecture is often the most effective way of communicating the energy and enthusiasm of a person who has actual experience in a field--and thus of motivating students.

Disadvantages. Although the lecture method can be an effective and efficient teaching method, it has a number of disadvantages.

a. The lecture does not lead to maximum achievement in certain types of learning. Speech skills, cooperative group thinking, and motor skills, for example, are difficult to teach with the lecture method. Students can develop such skills well only through practice. Moreover, the formal lecture alone is generally not appropriate for presenting material above the comprehension level of the cognitive domain. Because it allows for little or no student verbal participation, the formal lecture may also be inefficient for comprehension level lessons in which concepts and principles are developed.

b. The lecture does not provide teachers with an opportunity to estimate student progress prior to an examination. Within a single lecture period, we may unwittingly present more information than our students can absorb, and we have little accurate means during the lecture of determining what they have learned.

c. Too often, the lecture makes no provision for participation by the students. As a result, many students willingly allow the instructor to do all the work. Learning is an active process, but the lecture method tends to foster passiveness and dependence on the instructor.

d. Instructors may have to spend much time preparing for the lectures. With the demonstration performance method of instruction, students participate actively. With the case study and guided discussion methods, students participate verbally. The teaching interview relies heavily on the knowledge of an expert and provides for student involvement through a question and answer period. But with lecture, a greater burden for the total lesson rests on the instructor.

e. Finally, many instructors find it difficult to hold the attention of their students when they lecture for an entire class period. To use the lecture method effectively, we obviously need considerable skill in speaking.

The first two disadvantages of the lecture, difficulty in achieving certain types of learning and ineffectiveness of assessing student learning, are inherent in the method. The third, student passivity, while characteristic of the method can be alleviated with an effective lecture. The final two disadvantages, time of preparation and speech skills necessary for an effective lecture, provide the focus for the remainder of this chapter.

PREPARING THE LECTURE

When faced with the responsibility for planning and preparing a lecture, a primary requirement is to analyze the students. This requirement is especially critical because students tend to be passive when hearing a lecture. Your analysis of the students will greatly influence how you plan your instruction.

Student Analysis. There are two reliable methods for gaining student information. Used together they can be extremely useful. The first is to organize information you already have about the students. Knowing such variables as age, sex, rank, and experience can help you relate to your students. If one or more of these variables separates you from your students, you may want to give special attention to ways of emphasizing your similarities and reduce differences. The second method, when you have not talked to the group before, is to check with someone who has. Perhaps a friend or colleague has already lectured to the same group and can tell you what to expect.

Especially important are the questions, "What do students already know about my topic?" and "What do they need to know?" If some students are already experts, you will want to reveal your credentials in a pleasing but informative manner. If they know much less about the topic than you do, there may still be a problem. One of the greatest difficulties a lecturer faces is not to talk up or talk down to students. Only by carefully analyzing the needs and characteristics of the students can you be certain your comments are at the appropriate level.

Assuming that you have carefully assessed the students and written an appropriate student-centered objective, as discussed in Chapter 4, you are now ready to collect and arrange your information. What you already know and what you learn from others or from books will probably yield more information than you have time to present. Possession of extra and extended information is especially important in the informal lecture where students may ask questions, but it is also important in the formal lecture. Students can rightfully expect the lecturer to know more about the topic than is presented in the lecture.

In preparing the formal teaching lecture, you will want to follow a lesson planning process similar to the one discussed in Chapter 6 and illustrated in the sample lesson plan at the end of this chapter. Choice of an appropriate organizational pattern, the effective use of support material, a clear introduction, and a complete conclusion--all discussed in Chapter 6--will facilitate student understanding and retention. Although the major concerns of lesson planning are more or less common with all methods, some are of special importance with the lecture.

Lecture Development. Other chapters discuss items of vital importance to lesson planning and development. Research indicates that clear attention, motivation, and overview steps in the introduction of the lesson significantly improve learning by appealing to students, giving them a reason to listen, and providing a forecast of what will be taught. (See the Introduction of the sample plan.) Strong organization and clear verbal and visual support in the body of the lesson help students understand and retain the material. In the sample plan for the formal lecture, see how organization is planned and verbal support--definition, example, comparison, statistics, and testimony--are all used. Also visual support is planned. A complete conclusion to the lesson with final summary, remotivation, and closure reteaches, challenges, and leaves the students with a satisfying sense of completeness. With the teaching lecture each of these concerns becomes especially critical since the burden for presenting the lecture falls directly upon the instructor. In fact, every part of the lecture must be designed to elicit attention and challenge students to listen. If you do any less, you will not be totally effective. All verbal and visual support should be selected and used carefully.

Audiovisual Support. Chapter 19 discusses kinds of audio and visual aids available to the instructor. The sample lesson plan indicates that the instructor plans to use an audio cassette recording, an overview chart, overhead transparencies, and a student note-taking handout. Careful planning can help you choose appropriate and timely aids. Although audiovisual aids are both appropriate and useful with all teaching methods, they are especially important with the lecture. The following guidelines should help you in planning the use of visual support not only for the lecture but for all methods.

1. Use only materials that are relevant. Avoid using materials solely for aesthetic or interest value. Certainly visual materials should be interesting, but the primary purpose of any nonverbal aid is to portray or support an idea graphically for your students. Irrelevant materials distract from the idea you are presenting.

2. Use visual materials that are large enough to be seen by all the students. Nothing is so disturbing as to be seated in the back of the room unable to see the visuals. In preparing for your presentation, display the visuals, then move yourself to the location of your most distant listener. If you can't readily see the material, consider replacing it with something more appropriate.

3. Use visual materials only at the proper time. Do not expose the visual material until the proper point in the lecture. As can be seen in Part II of the sample plan, cues for audiovisual aids are clearly marked. Materials that are visible too soon, or those that remain in view after the point has been made, distract from and interrupt the continuity of the lecture. You may want to use the "striptease" or build-up method for revealing a series of points. Don't list ten main points for the students and then discuss each one. Instead, uncover the points one at a time to keep student attention focused.

4. Keep visual materials simple and clear as possible. Emphasize only the most important information. Omit unnecessary details. A series of simple charts is preferable to a single complicated one.

5. Talk to the student, not to the visual aid. If you are explaining a chart, look at your students as much as possible. By the time you make your presentation, you should be so familiar with your visual aids that it will be unnecessary for you to look at them closely. When possible,

paraphrase the visual instead of reading it.

6. Place visuals away from obstructions. Don't allow other objects or persons--including yourself--to obstruct the view of your students. You decided to use visual materials to support and clarify your lecture. Don't hinder their effectiveness by obstructing the student's view.

Humor. Appropriate humor is useful in a lecture. Humor relaxes both teacher and students. Humor serves this role especially well at the beginning of a lecture because it places the teacher directly in communication with the students. There are two reasons to use humor in the body of the lecture. One is to bring back the attention of the students. Humor regains attention. The second reason is to emphasize an important point. Although a humorous story or anecdote is seldom real proof, it may be the most powerful memory or clarification device a speaker can use. Notice how the sample lesson plan for the lecture incorporates humor into the planning.

Humor must be used properly if it is to be effective. There are five essentials to using humor:

1. Know the item thoroughly. If you know the story and have told it before, you will be able to tell it again and know the kind of response to expect. It is generally a good rule not to use a story or humorous item unless you have told it several times in informal situations so you can both practice and gauge the reactions of others.

2. Don't use off-color stories to get a cheap laugh. Even people who laugh at such stories in private often lose respect for the teacher who uses them in public.

3. Vitalize humor. Stories should be personalized so they are believable and sound as if they really happened. Rather than talk about "this guy I heard about" or "this truck driver," give the characters in the stories names. Successful comedians and speakers nearly always vitalize their humor.

4. Don't laugh before the audience laughs. If you fail to get the story across, laughing alone on a platform is disaster. If the joke fails, leave it and go on.

5. Capitalize on the unexpected. One of the primary elements of humor is that people laugh when they are surprised. A few years ago streaking was a fad on college campuses. Most firsthand observers laughed when confronted by a streaker. Some of the laughter was no doubt due to embarrassment; much of it was due to the element of surprise. The following are all types of humor which depend on the unexpected: quips (of course men aren't what they used to be--they used to be boys), puns (try our bread, we knead the dough), exaggeration (the heat was so terrific last week that I saw a hound dog chasing a rabbit; they were both walking), understatement (if at first you don't succeed...well, so much for skydiving).

Transitions. Transitions are statements used by the instructor to move from the introduction to the body of the lecture, between main points, between subpoints within each main point, and from the body to the conclusion of the lecture. Transitions signal to the students that we are progressing to a new point, but they are also important in maintaining the continuity of the information being given. Consider this transition:

> We have discussed the precedents for a mandatory physical fitness program in the military. Next we will consider the benefits of such a program.

This transition indicates a change in direction, but it does not indicate the reason for or importance of the change.

For transitions to be effective, they should (1) mention the point just discussed, (2) relate that point to the objective, and (3) introduce the next point. Suppose the objective is for students to know the need for a mandatory physical fitness program. Notice how all three steps are incorporated in the following transition:

> (1) We have discussed the precedents for a mandatory physical fitness program in the military, (2) but these precedents alone will not prove a need for such a program. To understand more fully that need, (3) we must next examine in several practical situations the benefits of mandatory physical fitness.

When planned and used correctly, transitions contribute substantially to the continuity of the total lecture. The model plan shows how the lecturer plans to use transitions.

Summaries. Summaries are useful tools for maintaining continuity within a lecture and for highlighting areas of particular importance. Summaries prepared for use between main points are not always necessary in the lecture. In fact, if the point is very clear, a summary may be unnecessarily redundant and boring, You should use them, however, when main points are unusually long or contain complex or unfamiliar information. With summaries we repeat information concisely and reinforce student understanding before new information is presented. Summaries should not take the place of transitions. They should provide a means for us to progress logically from one main point, through the transition, and into the next point.

The summary given in the conclusion of the lecture should be designed so that it reviews for the students those facts or those aspects of a concept or principle which you consider particularly important. It may be helpful to think of this summary as a "capsulized" version of the lecture itself, in which key ideas are related both to each other and to the lesson objective.

Questions. In both the formal and the informal lecture, questions may be used to add continuity to the lesson. In the formal lecture the instructor may plan rhetorical questions to use within a main point or in the conclusion of the lecture. Questions encourage students to review in their own minds the information that has been presented. They also indicate areas of special importance and should be phrased to allow students to see the relationship of these areas to the lesson objective. In the informal lecture, questions may be used at the same times and with the same usefulness in achieving continuity within a lesson. The difference, of course, is that students are encouraged to ask questions or to answer aloud those questions posed by the instructor. Chapter 11 discusses the use of questions in more detail.

PRESENTING THE LECTURE

Although preparing a lecture can be laborious, for many instructors the hardest part is actual presentation of the lecture. Questions instructors most often ask are: How many notes should I use? How can I overcome nervousness? What kind of physical behavior is appropriate for me to use when I speak? What if my voice isn't suited to speaking before a group? How can I project sincerity and enthusiasm? Answers to these questions will provide the basis for the remainder of this chapter.

Methods of presentation. Instructors, like all other speakers, use one of four common methods of presentation: (1) speaking from memory, (2) reading from manuscript, (3) speaking impromptu with no specific preparation, and (4) speaking extemporaneously with, ideally, a great deal of preparation and a limited number of notes. The fourth method usually allows us the most freedom in adjusting to an audience as we speak and is best suited for almost all instructing in the Air Force.

1. Memorizing. Speaking from memory is the poorest method of delivering lectures, and it should be used very sparingly or not at all in the classroom. While this method may seem to be helpful for persons who cannot think on their feet, the memorized lecture is a strait jacket. Such a lecture cannot be adapted to the immediate situation or student reactions. In other words, it does not allow the teacher to adjust to the particular situation. Moreover, the method is almost sure to destroy spontaneity and a sense of communication. The method also requires an inordinate amount of preparation, and the danger of forgetting is ever present.

2. Manuscript Reading. Reading a lecture from a manuscript allows for planning the exact words and phrases to use. But the disadvantages of this method of presentation far outweigh the advantages. Many instructors use the manuscript as a crutch instead of fully thinking through the ideas in the lecture. All too often the written lecture is regarded simply as an essay to be read aloud. Therefore, the lecture is too broad and has language which is too abstract to be understood when presented orally. Also, very few people can read from a manuscript with the same emphasis and spontaneity used with extemporaneous delivery.

If you must adhere closely to a manuscript, keep the following guidelines in mind:

- Keep spoken words simpler, clearer, and more vivid than in writing.
- Make sentences shorter and ideas less complex than in writing.
- Clarify the transitions between thoughts and ideas. Provide punctuation with vocal inflection, variety, and pauses.
- Use repetition to emphasize main ideas and key points.
- Use direct address when speaking about people. Person pronouns such as I, we, our, us, you are better than they, people, a person, the reader, the listener.
- Use concrete language where possible. Follow abstract or complicated reasoning with specific

examples, comparisons, and definitions.

- Prepare your manuscript to facilitate reading. Double or triple spacing, marking the manuscript, using only one side of the paper, and using shorter paragraphs may be helpful.

- Practice the lecture aloud several times to see how it sounds. Recording yourself on a cassette recorder and listening to the playback will help you to discover places where you may not be communicating effectively.

- Try to make your lecture sound like conversation, as if you were thinking the words for the first time as you read them.

- Practice looking at your audience most of the time as the manuscript becomes more familiar to you.

3. Impromptu. Speaking impromptu requires a tremendous amount of skill and knowledge. We may find it necessary at times to lecture on the spur of the moment without any preparation. But this method should be used only by experienced instructors who are saturated with their subjects and who have the ability to organize their thoughts for learning as they speak. Even these experienced instructors fall back upon thoughts and phrases they have used before. They have spent years, so to speak, in preparing to give an unprepared lesson.

4. Extemporaneous. The technique effective speakers use most widely, extemporaneous speaking, produces the most fruitful results when it is based upon full preparation and adequate practice. The lesson is carefully planned and outlined in detail. The instructor's only guide is a well-constructed outline like that given in Part II of the model. It is a lesson planned idea-by-idea rather than word-by-word.

The advantages of teaching from a well-planned outline are many. The method compels instructors to organize ideas and puts pressure on them to weigh materials in advance. It gives freedom to adapt a lesson to the occasion and to adjust to student reactions. It enables instructors to change what they plan to say right up to the moment of utterance. In short, the extemporaneous method permits the instructor to adhere to the two vital needs of effective teaching: adequate preparation and a lively sense of communication.

Nervousness. If a teacher suffers from stage fright, nervousness, or fear of speaking, students may also become uneasy or anxious. Yet some nervousness is both natural and desirable. Even skilled instructors often experience the queasy feeling of "butterflies in the stomach" as they prepare to speak. The secret is to get the butterflies "flying in formation" through practice. A visiting athletic team practices on a field before game time to accustom themselves to differences in terrain and environment. Similarly, the speaker may need to practice a new lecture several times, preferably in the room where the lecture will be given, before actually presenting it. Practice reminds us to look up the pronunciation of a word that is new or check an additional piece of information on an important point. Consider the following suggestions for overcoming nervousness:

Enthusiasm is the key when practice is over and you are ready actually to deliver the lecture. At times we may lecture on subjects that we find dull, but as we get more involved, the subject becomes more interesting. There is no such thing as a dull subject, only dull teachers. It is important to be enthusiastic about a subject, because enthusiasm can replace fear. And the more enthusiastic you are about the subject, the more involved the students will be both with you and what you are saying.

Hold good thoughts toward your students. The students in the audience are the same ones that you enjoy speaking with in a less structured environment. Most classes are made up of warm human beings with an interest in what you have to say. Students rarely boo or throw vegetables. Most students have great empathy for teachers and want them to do a good job.

Do not rush as you begin to speak. Many teachers are so anxious to get started that they begin before they are really ready. The little extra time taken to arrange your notes will generally pay big dividends. When you are ready to begin, look at the various parts of the class, take a deep breath, and begin to speak.

Physical Behavior. Communication experts tell us that over half our meaning may be communicated nonverbally. Although some nonverbal meaning is communicated through vocal cues, much meaning is carried by eye contact, bodily movement, and gestures. As teachers we need to know how physical behavior can improve our lecturing skill and thus enhance learning.

1. Eye contact is one of the most important factors of nonverbal communication. Nothing will enhance your delivery more than effective eye contact with your students. Eye contact is important for three reasons. First, it lets the students know that you are interested in them. Most people like others to look at them when talking. Second, effective eye contact allows you to receive nonverbal feedback from your students. With good eye contact, you can gauge the effect of your remarks. You can determine if you are being understood and which points are making an impact and which are not. You will be able to detect signs of poor understanding and signs that the students are learning. Then you can adjust your rate of delivery or emphasis. You can rephrase or summarize certain points or add more supporting data. Third, effective eye contact enhances your credibility. Teachers with greater eye contact are judged by students as being more competent.

To achieve genuine eye contact, you must do more than merely look in the direction of your listeners. You must have an earnest desire to communicate with them. The old advice of looking over the tops of your listeners' heads or attempting to look at all parts of the class systematically simply does not describe effective eye contact. Furthermore, looking at only one part of the audience or directing attention only to those students who seem to give you positive feedback may cause you to ignore large parts of the audience. Make it evident to each person in a small class and each part of the audience in larger auditoriums that you are interested in them as individuals and eager to have them understand the ideas you are presenting. In this way you will establish mental as well as sensory contact with your listeners.

Effective eye contact can be described as direct and impartial. You look directly into the eyes of your listeners, and you look impartially at all parts of the audience, not just at a chosen few.

2. Bodily movement is one of the important factors of dynamic and meaningful physical behavior. Good body movement is important because it catches the eye of the listener. It helps hold attention needed for learning to occur. But movement also represents a marked departure or change in your delivery pattern. It is a convenient way of punctuating and paragraphing your message. Listeners will know that you are done with one idea or line of thought and ready to transition to the next. Finally, aside from its effects on the listeners, it helps you as a lecturer. Movement helps you work off excess energy that can promote nervousness. Movement puts you at ease.

How much movement is desirable? Some rare teachers never move yet are quite effective. Unless the formality of the situation or the need to use a fixed microphone keep you in one position, then you probably should move frequently when presenting a teaching lecture. Movement from behind the lectern can reduce the psychological distance between you and the students and place them more at ease. Some instructors feel that they need the lectern to hold their notes. But instruction is actually more effective if you carry your notes with you rather than have to look down at the lectern to see them. But whenever you look at your notes, remember to bend your eyes not your head to the paper.

Of course, some instructors move too much. Perhaps out of nervousness they pace back and forth in front of the class. Still others have awkward movement that does not aid communication. Some leave their notes on the lectern then move in and out from behind it like a hula dancer. Others plant their feet firmly in one place then rock from one side to the other in regular cadence.

Effective body movement can be described as free and purposeful. You should be free to move around the class. You should not feel restrained to stay behind the lectern, but should move with reason and purpose. Use your movement to punctuate, direct attention, and otherwise aid learning.

3. Gestures may be used to clarify or emphasize ideas in the lecture. By gestures we mean the purposeful use of the hands, arms, shoulders, and head to reinforce what is being said. Fidgeting with a paper clip, rearranging and shuffling papers, and scratching your ear are not gestures. They are not purposeful and they distract from the verbal message. Placing both hands in your pockets, or behind your back, or in front of you in the fig leaf position severely limits their use for gesturing. Holding your shoulders and head in one position during the lecture will also rob you of an effective means of strengthening your communication.

Although gestures can be perfected through practice, they will be most effective if you make a conscious effort to relax your muscles before you speak, perhaps by taking a few short steps or unobtrusively arranging your notes. Effective gestures are complete and vigorous. Many speakers begin to gesture, but perhaps out of fear, they do not carry through and their gestures abort. Comedians get laughs from the audience by timing gestures improperly. A gesture that comes after the word or phrase is spoken appears ludicrous. Good gestures should come exactly at the time or slightly before the point is made verbally. Poor timing results from attempting to "can" or pre-plan gestures. Finally, good gestures are versatile. A stereotyped gesture will not fit all subjects and situations. Furthermore, the larger the audience, the more pronounced the gestures will need to be. As with all aspects of communication, gestures must fit the transaction.

In emphasizing the importance of gestures we are not advising that you adopt a dynamic, forceful mode of delivery if by nature you are quiet and reserved. As with movement, gestures should spring from within. Effective gestures are both natural and spontaneous. Observe persons talking with each other in a small group. We should try to approximate the same naturalness and spontaneity of gestures when we are lecturing.

Use of the Voice. A good lecturing voice has three important characteristics. It is reasonably pleasant, it is easily understood, and it expresses differences in meaning. Technically we might label these three properties as quality, intelligibility, and variety.

1. Quality refers to the overall impression a voice makes on others. Certainly a pleasing quality or tone is a basic component of a good speaking voice. Some persons have a full rich quality, others one that is shrill and nasal, and still others may have a breathy and muffled tone or quality. While basic aspects of quality may be difficult to change, your voice may become more breathy when you are excited, tense when suspense is involved, and resonant when reading solemn language. Students can often tell from the voice if the teacher is happy, angry, sad, fearful, or confident. Similarly vocal quality can convey sincerity and enthusiasm. Some teachers are over-concerned about the basic quality of their voices, but at the same time they pay too little attention to the effect of attitude and emotion on the voice. Most people have reasonably pleasant voices suitable for lecturing.

2. Intelligibility of your speech depends on several factors. Attention to articulation, pronunciation, volume, as well as avoidance of vocalized pauses, overuse of stock expressions, and substandard grammar can make your voice more intelligible.

- Articulation refers to the precision and clarity with which sounds of speech are uttered. A synonym for articulation is enunication. Good articulation is chiefly the job of the jaw, tongue, and lips. Most articulation problems result from laziness of the tongue and lips or failing to open the mouth wide enough. You should over-articulate rather than under-articulate your speech sounds. What sounds like over-articulation to you will come out as crisp, understandable words and phrases to your students.

- Pronunciation refers to the traditional or customary way words sound. Standards of pronunciation differ, making it difficult at times to know what is acceptable. Dictionaries are useful, but as they become outdated, they should not be adhered to excessively. Generally, educated people in your community (as well as national radio and television announcers) provide a good standard for pronunciation. Common faults of pronunciation are to misplace the accent (saying de-vice instead of de-vice), to omit sounds (guh'mnt for government), to add sounds (athalete for athlete), and to sound silent letters (mortgage or often). Do not overcompensate to the point that you call attention to your speech, but remember that pronunciation acceptable in informal conversation may be substandard when presenting a formal lecture.

- Vocalized pause is the name we give to syllables "a," "uh," "um," and "ah" often at the beginning of sentence. While a few vocalized pauses are natural and do not distract, too many impede the communication and learning processes.

- Overuse of stock expressions, such as "OK," "like," and "you know," should be avoided. These expressions serve no positive role in communication and only convey a lack of originality by the speaker.

- Substandard grammar has no place in the teaching lecture. It only serves to reduce teacher credibility with some students. Research shows that even persons who have been using substandard grammar all of their lives can, with diligent practice, make significant gains in this area in a relatively short time.

3. Variety is the spice of speaking. Students tire rapidly listening to a teacher who doesn't vary delivery style or a teacher with a monotonous voice. A teacher's voice that is intelligible and of good quality may still not appeal to students. You may vary your voice and at the same time improve the communication by considering the vocal fundamentals of rate, volume, force, pitch, and emphasis.

- Most teachers speak at a rate of from 120 to 180 words a minute when presenting a lecture. In normal speech, however, we vary the rate often so that even within the 120 to 180 word constraints there is much change. The tempermentally excitable person may speak at a rapid rate all the time, and the stolid person generally talks in a slow drawl. The enthusiastic but confident individual, though, will vary the rate of delivery to emphasize ideas and feelings. A slower rate may be appropriate for presenting main points, while a more rapid rate may lend itself to support material. The experienced lecturer also knows that an occasional pause punctuates thought and emphasizes ideas. A dramatic pause at the proper time may express feelings and ideas even more effectively than words.

- Volume is important to the lecturer. Always be certain that all the students can hear you. Nothing hinders the effect of a lecture more than to have some students unable to hear. On the other hand, the lecture should not be too loud for a small room. A bombastic or overly loud speaker tires listeners out very quickly.

- Force or vocal energy is needed at times to emphasize and dramatize ideas. A drowsy audience will come to attention quickly if the teacher uses force effectively. At times a sudden reduction in force may be as effective as a rapid increase. By learning to control the force of your voice, you can help to add emphasis and improve communication.

- Pitch is the highness or lowness of the voice. All things being equal, a higher pitched voice carries better than a low pitched one. On the other hand, students will tend to tire faster when listening to the higher pitched voice. If your voice is within normal limits--neither too high or too low--work for variety as you speak. Try not to become firmly entrenched in your habitual pitch level.

- Emphasis obviously stems from all forms of vocal variety, and any change in rate, volume, force, or pitch will influence the emphasis. The greater or more sudden the change, the greater the emphasis will be. As a lecturer you will want to use emphasis wisely. Two things should be avoided: *over*emphasis and *continual* emphasis. Be judicious. Emphasizing a point beyond its real value may cause you to lose credibility with your students.

Sincerity. A lecturer certainly needs to prepare well and possess strong delivery skills to do an effective job in the classroom. But something more is needed. To be really effective a teacher must be sincere. So long as you obviously try to generate light and not merely heat, students will be amazingly tolerant of weaknesses in both preparation and delivery. But give them a chance to suspect your sincerity, and you lose effectiveness. And once lost, effectiveness is nearly impossible to regain. What is sincerity? Sincerity may be defined as a state of appearing to be without deceit, pretense, or hypocrisy--a state of honesty, truthfulness, and faithfulness.

Sincerity toward students is reflected in your eye contact, enthusiasm, and concern about students, both as individuals and as learners. Sincerity toward the subject is judged by whether or not you seem involved and interested in the subject or topic of the lecture. Sincerity toward self is displayed in the confidence and concern you have that you are doing the best job possible in the classroom. Lack of sincerity in any of these areas will almost certainly directly hinder learning.

Verbal Interaction. The verbal interaction in the *informal lecture* takes place in two ways. Students should ask questions to clarify confusing points or to ensure their understanding of the information. The instructor should also question the students during an informal lecture. By asking both planned and spontaneous questions, he or she can stimulate participation, emphasize important points and, most important, judge whether or not students understand the material.

To be most effective, verbal interaction should occur consistently throughout an informal lecture. The instructor must allow ample time for discussion when planning and practicing the lesson and, during the Introduction, should encourage questions. By comparing the sample lesson plans at the end of this chapter, we can see the substantial differences in planning for the informal and formal lecture. Students will be more likely to participate if the instructor indicates, through direct eye contact, frequent pauses, and a relaxed delivery, that he or she is sincerely interested in student input. Instructor questions are especially effective when they require students to summarize important information or to provide additional support in the form of personal examples.

Although frequent verbal interaction is a goal of the informal lecture, it should not take priority over achievement of the lesson objectives. If a portion of the material is complex, unfamiliar to the students, or follows a necessary sequence, the interruption of questions may be distracting or cause confusion. In this case the instructor should ask students to hold their comments until after that material has been presented. This additional structure may also be necessary when time constraints do not allow student participation towards the end of a lecture. Careful planning is needed to ensure a comfortable balance between the material to be presented and the questions to be shared.

SUMMARY

Formal and informal lectures are popular teaching methods in the military. Advantages of the lecture are (1) presentation of many ideas in a short time, (2) suitability for introducing a subject, (3) convenience for instructing large groups, (4) value for supplementing material from other sources, (5) allowance for a large number of students to hear an expert. Disadvantages are (1) not appropriate for certain types of learning, (2) no provision for teacher to estimate student progress, (3) no active participation by students, (4) requirement for too much preparation, (5) dependence on speaking skill.

To prepare for a lecture we must analyze our student audience, carefully plan the beginning and ending of the lecture, and organize and choose verbal supporting materials to help students listen and understand. In addition, we should consider using humor when appropriate, choose visual aids wisely, and plan transitions and interim summaries when needed. When presenting the lecture, we need to select the method for presentation, overcome nervousness, attend to physical factors of eye contact, movement, and gestures, and strive for a pleasant, communicative, and expressive voice. Above all, we need to show sincerity toward our students, our subject, and ourselves.

LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Early Developments in Military Aviation
INSTRUCTOR: Capt Tice

TEACHING METHOD: Formal Lecture

REFERENCES: Instructor Handbook for The Air Force Today, AFROTC/AU/1974; U.S. Air Power: Ascension to Prominence, AFROTC/AU/1974; Of Those Who Fly, AFROTC/AU/1972; Through the Eyes of Aviators, AFROTC/AU/1973.

AIDS/HANDOUTS: Overview chart, overhead projector

PART IA

LESSON OBJECTIVE(S): The objective(s) of this lesson (~~is~~, are) for each student to know the significant developments in military aviation (1) prior to World War I, (2) during World War I, and (3) between World War I and World War II.

SAMPLES OF BEHAVIOR:

1a. Describe the origins of military aviation
 b. Identify uses of military aircraft prior to World War I.
 c. List accomplishments of selected military aviators prior to World War I.

2a. List military air functions in World War I.
 b. State the extent of U.S. military air contributions in World War I.
 c. Identify significant accomplishments of selected aviators during World War I.

3a. Name General Mitchell as Commander of Aeronautical Branch after World War I.
 b. Outline the major accomplishments of General Mitchell prior to his courts-martial.
 c. State the primary mission of the Army Air Corps Tactical School up to World War II.

PART IB

ORGANIZATIONAL PATTERN: Chronological

STRATEGY: This lecture will trace significant developments in military aviation occurring prior to World War II. The content lends itself to chronological development with three main time division. To appreciate the importance and strength of current military aviation, students must first know the confusion and indecision which characterized it prior to W.W. I (Obj 1). The relationship between W.W. I and expanded aviation missions and forces (Obj 2) can then be developed. Finally, it will be shown that the momentum for growth provided by W.W. I lead to significant moves toward a separate air service prior to W.W. II (Obj 3).

LESSON OUTLINE

Objective(s)/Main Points/Subpoints

1. (K) Significant developments in military avaiation prior to World War I.

    a. First flight of heavier than air craft
    b. Military Aeronautical Division in Signal Corps
    c. First U.S. military aircraft
    d. First U.S. aviation combat operations
    e. U.S. entry into World War I

2. (K) Significant developments in military aviation during World War I.

    a. European development
    b. U.S. entry into the war
    c. U.S. accomplishments and personalities
    d. St. Mihiel and Meurse-Argonne
    e. Public recognition of air battles

3. (K) Significant developments in military aviation between World War I and World War II.

    a. General Billy Mitchell
    b. Air Corps Tactical School
    c. Moves toward a separate air service
    d. Advances in equipment and technology

PART II

TEACHING PLAN

INTRODUCTION

ATTENTION: (Rhetorical questions) Who was the first Airman to be awarded the Medal of Honor? Did you know that Capt Barry Goldwater flew in the first flight of single engine fighters to fly the Atlantic? Did you know that Lt Frank Luke had 18 kills in 18 days during World War I?

MOTIVATION: As ROTC cadets, each of you is considering a commitment to the Air Force. Knowing the history of our service, and particularly of U.S. military aviation, can help you strengthen that commitment and develop an appreciation for the professional heritage we share.

OVERVIEW: (Flipchart) We will review selected events and personalities of early military aviation during three broad periods:

1.	Prior to World War I	(1907-1917)
2.	During World War I	(1917-1918)
3.	Between the World Wars	(1919-1939)

TRANSITION: Today in military aviation we have sophisticated aircraft with complex weapons systems. The situation was quite different in these earliest periods of military aviation.

DEVELOPMENT

1. Significant developments in military aviation prior to World War I.

   a. First flight of heavier-than-air craft
      (1) Wright brothers - 1903
      (2) Discontinued activities due to patent problems - 1905-8

   b. Military Aeronautical Division in Signal Corps
      (1) Prompted by inquiry from President Roosevelt
      (2) Included one officer, two enlisted personnel
      (3) Operations confidential

   c. First U.S. military aircraft
      (1) Specifications developed - 1907: 40mph, 1 hour flying time, 2 passengers, able to land without damage, "dismountable."
      (2) Three contracts awarded initially - two forfeited
      (3) Acceptance flight flown - 1909
         (a) Pilot - Orville Wright
         (b) Army observer - Lt Frank P. Lahm
      (4) No operational mission defined - planes used
         (a) for reconnaissance
         (b) as directed by commander

d. First U.S. aviation combat operations
    (1) General Pershing in Mexico - 1916
    (2) Reconnaissance and communications dispatch
    (3) Eight aircraft taken - six destroyed and two returned but destroyed as unsafe
    (4) Need for more and better equipment

e. U.S. entry into World War I - 1917
    (1) 35 flying officers - 1000 enlisted men

TRANSITION: Military aviation prior to World War I was characterized by indecision and confusion. No clear mission beyond reconnaissance was established. World War I brought with it the need for military aviation in various roles, and both the mission and the force expanded greatly.

2. Significant developments in military aviation during World War I.

a. European development
    (1) More rapid than U.S.
    (2) Extensive early reconnaissance and artillery direction
    (3) Efforts to disrupt reconnaissance led to aerial combat and pursuit
    (4) Development of air superiority strategies and tactics

b. U.S. entry into the war - late in 1917
    (1) No aviation involvement until spring 1918
    (2) European equipment and tactics used
    (3) Primary roles were reconnaissance and pursuit

c. U.S. accomplishments and personalities
    (1) Lt Field Kindley
        (a) 148 Aero Squadron
        (b) First American credited with aircraft kill-13 July 1918
    (2) Lt Frank Luke
        (a) Flew combat mod August to 29 September 1919
        (b) Characterized by Bill Luke as headstrong, undisciplined
        (c) Once landed beside burning balloon he had shot down to get confirming signature from ground witnesses
        (d) 18 September 1918 - five kills in ten minutes (two balloons, 3 aircraft)
        (e) 29 September 1918 - three kills in last mission (18 in 18 days)
        (f) Killed in action - first American to win Medal of Honor
    (3) Capt Eddie Rickenbacker - leading American ace of World War I

d. St. Mihiel & Meurse-Argonne
    (1) Control point for almost 1500 aircraft - one-third American
    (2) Commanded by Gen Billy Mitchell
    (3) New concept of air supremacy under central control

- e. Public recognition of air battles
    - (1) Exciting and colorful
    - (2) Contrast to ground actions

TRANSITION: World War I gave U.S. military aviation its first combat test and a clear mission. Acknowledgement of its full value, however, would have to be achieved during the years between the World Wars.

3. Significant developments in military aviation between World War I and World War II.

- a. Gen Billy Mitchell
    - (1) Director of Military Aeronautics - 1919
    - (2) Early believer in offensive air doctrine and equal status with Army and Navy
    - (3) Air Service - 1920 - combatant branch of Army
    - (4) Demonstration of bombing effectiveness - 1921
        - (a) German battleship sunk
        - (b) Navy interest in aviation followed
        - (c) Proved defensive & offensive use of bombing
    - (5) Courts Martial - 1925
        - (a) Charges preferred by President Coolidge
        - (b) Used as a forum by political and military enemies
        - (c) Given five year suspension - chose to resign

- b. Air Corps Tactical School
    - (1) 1920 - Langley 1931 - Maxwell
    - (2) Little experience on which to base teaching - concerned with developing air doctrine
        - (a) Strategic bombing doctrine developed - led to B-17
        - (b) Pursuit doctrine neglected - fighter equipment and tactics not developed until 1943
    - (3) Responsible for almost all military aviation strategy and tactics between World Wars - training ground for World War II leadership

- c. Moves toward a separate air service
    - (1) Gen Billy Mitchell was early leader
    - (2) No major changes made by Army & Navy in defining separate role for military aviation
    - (3) No clear decision by Army & Navy for responsibility of coastal defense

- d. Advances in equipment and technology
    - (1) Lindbergh's cross-Atlantic flight (1927) gave impetus to military aviation - no limit to flying capabilities
    - (2) Early refueling efforts
    - (3) Instrument flight capability
    - (4) First all metal aircraft - Martin B-10 bomber
    - (5) B-17 in 1937 - higher and faster than pursuit aircraft - carried up to 5000 lb bomb load

TRANSITION: Military aviation showed tremendous advancement from 1903 to the beginning of World War II. We have discussed only a few highlights of that advancement, but there are some events and individuals which are especially important to remember.

CONCLUSION

SUMMARY

1. Significant developments in military aviation prior to World War I.
    a. Wright-Brothers - 1903
    b. Problems in Mexico - 1906
    c. Military Air in the Signal Corps - 1907

2. Significant developments in military aviation during World War I.
    a. Europeans ahead of U.S. in equipment and tactics
    b. Primary mission was reconnaissance and patrol/pursuit
    c. Secondary mission was bombing, interdiction and communications
    d. Public recognition was large and positive

3. Significant developments in military aviation between World War I and World War II.
    a. Gen Mitchell was early true believer - frustrations and courts martial
    b. Army Air Corps Tactical School
        (1) Developed strategic bombing doctrine
        (2) Training ground for World War II leadership
        (3) Responsible for development of B-17
    c. No successful moves toward separate air service
    d. Progress in technology crowned by B-17

REMOTIVATION: Today we have looked at some highlights of military aviation in its early days. Many more fascinating events and individuals are included in this time frame. I encourage you to read and learn as much as you can about them. Knowledge of and appreciation for our professional heritage can help to make each of us more informed, dedicated, and effective as Air Force professionals.

CLOSURE: Study of history can prevent us from having to "re-invent the wheel" with each generation, each job, or each change in personnel.

PART III
TEST ITEMS

- **LESSON OBJECTIVE:** Know significant developments in military aviation during World War I.

1. **SAMPLE OF BEHAVIOR:** List military air functions in World War I.

QUESTION: (Multiple Choice)

The two primary military air functions in World War I were patrol/pursuit and

a. courier.
b. interdiction.
c. reconnaissance.

KEY: c

2. **SAMPLE OF BEHAVIOR:** Identify significant accomplishments of selected aviators during World War I.

QUESTION: (Matching)

Column A lists accomplishments in aviation. Column B lists World War I aviators. In the space to the left of each accomplishment, place the letter corresponding to the aviator responsible for that accomplishment. Each item in Column B may be used once or more than once.

	Column A - Accomplishments	Column B - Aviators
a	1. First American credited with aircraft kill	a. Lt Field Kindley
b	2. First American to win Medal of Honor	b. Lt Frank Luke
b	3. Five kills in ten minutes	c. Capt Eddie Rickenbacker
c	4. Leading American ace of World War I	

- **LESSON OBJECTIVE:** Know significant developments in military aviation between World War I and World War II.

3. **SAMPLE OF BEHAVIOR:** State the primary mission of the Army Air Corps Tactical School up to World War II.

QUESTION: (True/False)

The primary mission of the Army Air Corps Tactical School up to World War II was to develop military aviation strategy.

X True
False

LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Democracy
INSTRUCTOR: Capt Williamson
TEACHING METHOD: Informal Lecture
REFERENCES: Two Ways of Life: The Communist Challenge to Democracy
by William Ebenstein

AIDS/HANDOUTS: Flipcharts and overhead slides

PART IA

LESSON OBJECTIVE: The objective of this lesson is for each student to comprehend the concept of democracy.

SAMPLES OF BEHAVIOR:

1. Summarize the concept of democracy.
2. Give new examples/nonexamples of democracy.
3. Differentiate between examples and nonexamples of democracy.
4. Defend a given country as an example of a democracy.
5. Explain why given scenarios do/no not depict the concept of democracy.
6. Describe why a given attribute is critical to the concept of democracy.
7. Distinguish critical attributes of democracy from variable or nonattributes.
8. Explain the critical attributes of a democracy.
9. Define democracy in own words.

PART IB

ORGANIZATIONAL PATTERN: Topical (AIS Concept)
STRATEGY: Basic elements needed for concept formation are used in their typical sequence. The lesson starts with two definitions given in the test. The broader definition is chosen for development. With the definition selected, attention turns to selection of critical attributes of a democracy which fall within the parameters of the chosen definition. The United States is developed as an example of democracy since each attribute is illustrated in the American way of life. Statistics, comparisons, contrasts, and additional examples are used to develop the attributes and the example. Overhead questions are used to invite student involvement. To further concept development through contrast, life in an Eastern European country is examined as a nonexample. While communist nations claim to have "democratic" governments, this one nonexample illustrates that their way of life lacks the attributes of a democracy. The lesson will be developed through the informal lecture method. Instructor-student interaction will be used to aid in the development of the key points.

LESSON OUTLINE

Objective(s)/Main Points/Subpoints

The objective of this lesson is for each student to comprehend the concept of democracy.

I. (K) Two definitions of democracy

   A. Focus on government
   B. Focus on "way of life"

II. (C) Critical attributes/United States as an example

   A. Recognizes the basic equality of all
   B. Values the individual above the state
   C. Makes government the servant of the people
      1. Individual action over group action
      2. Nongovernmental action over governmental action
      3. Local government over state and state over national
      4. Voluntary action over coerced action
   D. Based on the rule of law
   E. Guided by reason and experience
   F. Based on majority rule
   G. Procedures or means used to achieve goals are significant

III. (C) Eastern European country as a nonexample

   (Same subpoints as in MP II above)

PART II
TEACHING PLAN

INTRODUCTION

ATTENTION:
- Recent incidents in international relations.
- Recurring conflict between democracy and communism.

MOTIVATION:
- Military duty to defend democracy; taken an oath.
- Need to understand concepts behind the struggle to be willing to put life on the altar of patriotism.
- Future of all may be at stake.

OVERVIEW: (Chart #1)
- Concept of democracy:
  - Two definitions
  - Characteristics/extended example - American way of life
  - Nonexample - An Eastern European country
- Encourage students to ask questions.
- Will be asking questions throughout MP 2.

TRANSITION:
- Background of term "democracy":
  Greek word "democratia" - rule of the people.
  Greek city-states small (like American county); government carried on by people in small assembly; every citizen had right and duty to participate (not women and slaves).

DEVELOPMENT

I. (K) Two Definitions of Democracy as given by Ebenstein.

A. DEFINITION 1: (Chart #2) "Type of government in which people rule themselves directly or indirectly through elected representatives."
1. Indirect is more common.
2. Direct existed in ancient Greece, New England towns.

B. DEFINITION 2: (Chart #3) "Type of society or 'way of life' characterized by rule of law; emphasis on dignity of individual; equality before law; majority rule with rights of individual held sacred."
1. Will focus on this definition.
2. Democracy applies to all human relations (Government, business, religion, education, family); therefore, called "a way of life."

TRANSITION: Now that we have a basic idea of what a democray is, we are ready to determine characteristics which distinguish democracy from other ways of life.

II. (C) The Critial Attributes/Examples of a Democracy.

A. Democracy recognizes basic equality of all.

1. Not identical, but in basic respects equal.
2. Common trait...ability to reason.
3. Equality comes from what people have in common rather than from what separates them.

QUESTION: What does "basic equality" mean to you?

ANT. RESPONSES:
- Same rights for all (life, liberty, etc.)
- Inalienable rights
- Opportunity to develop potential
- All considered unique with dignity

QUESTION: How does democracy protect this equality?

ANT. RESPONSES:
- Founding documents (Declaration of Independence, Constitution).
- Current laws...no discrimination.
- Civil Rights Act of 1964.

B. Democracy values individual above the state.

1. No one guilty of crime because of social, political, religious, racial group; judged by own actions not group you belong to (i.e., Nazis had to be proven guilty of war crimes).
2. Comparison with other ways of life:
    a. Facism: emphasis on large group--nation.
    b. Communism: on social class.
    c. Nazi German: ethnic/religious group.
    d. Punishment according to group membership.
3. Quality of the individual determines the vitality of democracy.

QUESTION: Why do we place so much value on the individual?

ANT. RESPONSES:
- Judeo-Christian heritage; i.e., all children of God.
- Responsible to Maker for actions.
- Emphasis on bold individualism; i.e., Horatio Alger, Helen Keller, Henry Ford, Thomas Edison; progress through individuality not conformity.

C. Democracy makes government servant of the people.

1. State is a mechanism to be used for purposes higher than itself. Job is to maintain peace and order; not the moral guide and teacher of society.
2. When problems are bigger than the individual, or many individuals are affected, group action is justifiable.
    a. Individual action preferred to group action (choice of church, politics, residence).
    b. Non-government action preferred to government (i.e., debate over national health insurance).
    c. Local government preferred to federal government (i.e., national policy for military vs local draft board).
    d. Voluntary action over coerced action (i.e. farm subsidies).

QUESTION: Why would we prefer local vs federal government action?

ANT. RESPONSES:
- Closer to direct involvement.
- Individual responsibility can be exercised; almost anonymous action at federal level.

D. Democracy based on rule of law.

1. Government officials must act in harmony with law; can only do what law authorizes or obliges him to do (i.e., Watergate, Agnew).
2. Citizen may do anything not specifically prohibited by law--broad range of actions (vs Russia where arrested because "not in best interest of state").
3. Bottom line--impartial justice vs arbitrary and whimsical.

E. Democracy guided by reason and experience.

1. "Truth" constantly being checked and verified.
2. No absolute certainty about views (i.e., Presidential elections are 52% to 48%); close results prove that neither party is as right as it thinks nor as wrong as opposing party claims).

QUESTION: Modern democracy has developed over a period of six centuries. In what respects is it continuing to change?

ANT. RESPONSES:
- Changing laws of war.
- Roles of women.

QUESTION: How do we know what to change?

ANT. RESPONSES:
- Free access to information (Nixon, Iran).
- Can take full advantage of national experience.

F. Democracy based on majority rule/minority rights held sacred.

1. Freedom of opposition; resolve issue through compromise (i.e., more than one political party).
2. Believe in at least two sides to every question (i.e., Olympic boycott, Iran).
3. Those who disagree are opponents, not enemies.

QUESTION: How do we prevent minority rights from going too far?

ANT. RESPONSE:
- Laws against some minority actions (i.e., violent overthrow).

G. Democracy means democratic procedures or means used to achieve goals.

1. "Due process" ... protect citizen's rights against the government.
2. Ends exist separately from means--even in war democracy proceeds according to laws.
3. Differences over means are at the heart of the difference between democracy and totalitarianism.

QUESTION: Due process forms the cornerstone of democracy. How does it protect citizen's liberty from "ends" of the government?

ANT. RESPONSES:
- Warrants to search
- Limits to wiretap
- Right to counsel
- Jury of citizen peers

QUESTION: These things may help citizens accused of crime. But other than elections, what procedures are there for the rest of us?

ANT: RESPONSES:
- Public polls
- Letters to editor, congressmen
- Citizens testify at senate subcommittees

TRANSITION: The United States is clearly a democracy by the seven characteristics we have developed. But what about a country existing under communist rule? What exactly makes it so different? To find out, we are going to review our seven characteristics of democracy and see how each is regarded in an Eastern European country.

III. (C) Selected Nonexample of Democracy.

A. Does this society recognize basic equality of all?

1. Equality of all is extolled in declaratory policy.
2. Slogan of "socialist brotherhood" used to give workers sense of equality with managers, professionals, bureaucrats.
3. In fact, there are rewards for Party loyalty and connections--these create an "elite" who enjoy highly privileged position.

B. Does this country value individual above state?

1. Value of individual is to serve state.
2. Personal significance is measured only in contribution to state, or society, or society as a whole.
3. Individualism discouraged--publicly condemned.
4. Collectivism (working and living in conformity with group) is praised.
5. Freedom of the individual has to be surrendered whenever it suits the state.

C. Does this country make government servant of the people?

1. People serve state (government and Party). Through service, they gain benefits of socialism: right to work, protection of welfare.
2. All needs are provided by state through collective effort of each person.
3. Free enterprise is very limited.

D. Does this country operate on basis of rule of law?

1. Law prevails in area of criminal justice.
2. Opposing political views/actions not permitted.
   a. Rights granted under law disregarded for people suspected of political activity.
   b. Integrity of Party rule placed ahead of laws governing individual rights.
   c. Often punish and destroy without even the pretext of individual rights.

E. Is this society guided by reason and experience?

1. Reason/experience colored by Marxist interpretation made by Party leadership.
2. Party is source of wisdom, truth, power, goodness.
3. Party guides society.

F. Is this society based on majority rule with rights of the minority held sacred?

1. Rule is by small Party elite--theoretically elected by majority.
2. In practice Party (which is minority) selects its own leadership from the top down.
3. Several Parties, each representing ethnic group, do exist. Rights of minority (each ethnic group) may exist within individual parties.

G. Are democratic procedures or means used to achieve goals in this country?

1. Goals achieved by "democratic centralism."
2. In theory, discussion and proposals originate at low levels, are passed to Party leadership, which makes decisions.
3. In practice, power only flows from top down. Party leadership decides means to achieve goals it dictates.
4. Duty of each individual to work for achievement of these goals.
5. Recognizes no limits to the means to attain goals: propaganda, imprisonment, terror, slave labor, brainwashing.

TRANSITION: It is clear that our Eastern European country does not possess the seven attributes which make up a democracy. It is therefore a nonexample of this way of life.

CONCLUSION

SUMMARY:
- Review the definition of democracy
- Review 7 key attributes and reasons why U.S. is classified as a democracy.
- Review basic reasons why an Eastern European country is not a democracy (conformity vs individuality).

REMOTIVATION:
- Democracy can hardly be called "natural."
- Democratic way of life is exceptional--not natural, and very difficult.
- Does not emerge spontaneously, or by accident; result of painstaking effort.
- You must be, and are, involved in preserving this way of life. This better understanding of the concept of democracy will help, but only if you take an interest.

CLOSURE: With regard to involvement, perhaps we should take note of what Pericles, the greatest spokesman for Athenian democracy, had to say about the necessity for each citizen to be involved in the democratic process:

"An Athenian citizen does not neglect public affairs because he is too concerned with his private business. We regard a person who takes no interest in public affairs, not as 'quiet' but as 'useless'."

PART III

TEST ITEMS

LESSON OBJECTIVE: The objective of this lesson is for each student to comprehend the concept of democracy.

1. SAMPLE OF BEHAVIOR: Distinguish critical attributes of democracy from variable or nonattributes. (Given a scenario containing the description of a country's "way of life," and three ways of categorizing that country, select the appropriate category by distinguishing critical attributes of democracy from variable or nonattributes.

QUESTION: (Multiple Choice)

Franzilaguay's President, Jimmy Anzio, recently proclaimed that his country is a democracy. In characterizing the way of life in Franzilaguay, he stated that actions of the government and people are based on the rule of law. His government serves as the servant of the people. President Anzio stressed the need for equality among all citizens. Each person is insured life, liberty, and the pursuit of happiness. Freedom of the press and of religion are guaranteed under the constitution. Information is said to flow freely between various levels of the government, and the citizens are protected by due process. Both the government and the people are guided by reason and experience. Everyone can vote. If what President Anzio says is true, how would you characterize the way of life in Franzilaguay?

a. A democracy
b. A non-democracy
c. Unknown -- Insufficient evidence available for making a decision.

KEY: c

2. SAMPLE OF BEHAVIOR: Explain the critical attributes of a democracy. (Given the requirement to explain three critical attributes of a democracy, write an acceptable explanation of each.)

QUESTION: (Essay)

Democracy (1) recognizes the basic equality of men, (2) values the individual above the state, and (3) makes government the servant of the people. In no more than 200 words each, explain these three characteristics of democracy. Include a description of each and a reason why the characteristic is critical to a democracy. The question will be scored on content only (45 points total). Partial credit will be given.

KEY: The explanation should describe the attribute and tell why it is considered to be a critical attribute of the concept. Fifteen points should be awarded for adequate coverage of each attribute.

3. SAMPLE OF BEHAVIOR: Define democracy in own words. (Given the requirement to define democracy, write an acceptable definition.)

QUESTION: (Essay)

In 50 words or less, define democracy in your own words. This question is worth 10 points and will be scored on content only. Partial credit may be given.

KEY: Definition - A type of society, or "way of life," characterized by such elements as the rule of law; emphasis on the dignity of the individual, equality before the law, and majority rule with rights of the minority held sacred. For full credit, the student should include at least four critical characteristics. Partial credit may be given for the alternate definition of democracy as a form of government, but full credit is reserved for the definition based upon the "way of life."

LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Transactional Analysis in the Classroom
INSTRUCTOR: Lt Col Bradwell

TEACHING METHOD: Formal Lecture
REFERENCES: Born to Win, James & Jongeward, 1973; I'm OK, You're OK, Harris, 1969; T.A. in Social & Communication Training (Kit), Human Development Institute, 1973.
AIDS/HANDOUTS: Film slides, audio-tape, magnetic board figures and chalkboard.

PART IA

LESSON OBJECTIVE(~~S~~): The objective(~~s~~) of this lesson (is, ~~are~~) for each student to comprehend that transactional analysis can be used by instructors to improve interpersonal relations within the academic environment.

SAMPLES OF BEHAVIOR:

1. Give original examples which illustrate the effective use of transactional analysis to improve interpersonal relations within the academic environment.

2. Summarize concepts developed from transactional analysis theory that can be employed to improve interpersonal relations within the academic environment.

3. Given a situation involving interpersonal relations within an academic environment, explain ways transactional analysis could be used to improve the situation.

4. Defend the use of transactional analysis as a management tool for improving interpersonal relations within the academic environment.

PART IB

ORGANIZATIONAL PATTERN: Topical

STRATEGY: Four principles will be used in support of the principle stated in the objective. Basic to comprehending the objective is an understanding of the ego state structure which is the focus for the first main point. Once this understanding is established, transactions between individuals can be examined. Either stamp collecting or stroking could be covered in the third main point. However, stroking leaves the biggest impact on the audience and serves as an effective final main point. When the relationship among the main points is established in the conclusion of the lesson, the generalization in the objective results.

LESSON OUTLINE

Objective(s)/Main Points/Subpoints

The objective of this lesson is for each student to comprehend that transactional analysis can be used by instructors to improve interpersonal relations within the academic environment.

1. (C) The ego state structure of transactional analysis can be used to explain individual differences encountered in the classroom.

    a. Certain thoughts, feelings, and attitudes with associated behaviors identify the Parent, Adult, and Child ego states
    b. Relationship to Freudian concepts of id, ego, and superego
    c. Scientific foundation for theory
    d. Formation period for each ego state
    e. Behavioral description of each ego state with further divisions of Parent and Child ego states
    f. Personality description of people with rigid ego state boundaries
    g. Blocked ego states
    h. Main point one

2. (C) Analysis of transactions occurring in the academic environment can lead to improved communications between individuals.

    a. Concept of complementary transactions
    b. Concept of crossed transactions
    c. Concept of ulterior transactions
    d. Main point two

3. (C) Stamp collecting within the academic environment can adversely affect interpersonal relations.

    a. Concept of stamp collecting
    b. The need to control feelings develops early in life
    c. Collecting stamps leads to growing resentment toward another resulting in jusitification for the person's behavior
    d. People collect stamps for small, medium, large, and ultimate prizes
    e. Burning stamp books
    f. Counseling individuals on irritants
    g. Main point three

PART IB (Cont'd)

4. (C) Stroking can be used as an effective tool for improving interpersonal relations within the academic environment by meeting a student's need for recognition.

   a. Human need for touch
   b. Human need for recognition
   c. Debit/credit concept of stroking
   d. Concepts of positive, negative, and plastic strokes
   e. Main point four

5. (C) Transactional analysis can be used by instructors to improve interpersonal relations within the academic environment.

   a. Key ideas in main points
   b. Relationship among the main points
   c. Conclusion stated as the lesson objective
   d. Additional examples supporting the objective

Part II
TEACHING PLAN

INTRODUCTION

ATTENTION: Film clip from Air Force Now 51 (5 minutes)

MOTIVATION: Joke about Thomas Harris

Quote on maintenance of morale and military effectiveness from Abnormal Psychology and Modern Life by James Coleman

Emphasis on T.A. in PME schools and throughout Air Force

OVERVIEW: To be covered, four major concepts of T.A. and their relationship to improvement of interpersonal relations in the academic environment. They are:

1. The Ego State Structure
2. Transactions
3. Stamp Collecting (Slide)
4. Stroking

TRANSITION: If we are to understand how transactional analysis can assist instructors in improving interpersonal relations within the academic environment, then we need to start with the most basic concept which is the ego state structure of the individual.

DEVELOPMENT

MAIN POINT 1. The ego state structure of transactional analysis can be used to explain individual differences encountered in the classroom.

a. Relationships of ego states to cognitive and behavioral states (slide)
b. Freudian concepts of id, ego, and superego
c. Examples of behavior - tone of voice, words, posture, etc.
d. Famous attorney example
e. Scientific foundation for theory
f. Early formation of ego states (slide)
g. Two parts of Parent ego state (slide)
h. Role of the Adult ego state (slide)
i. Three parts of Child ego state (slide)
j. Examples of ego states - creative thinking/drinking
k. Rigid ego state boundaries (slide)
l. Blocked ego states (slide)

TRANSITION: Now that we have an understanding of the ego state structure of transactional analysis and how this structure can be used to explain individual differences, we can turn to the different ego states and how they are involved in our communications with others, or in T.A. terminology, transactions with others.

Part II
TEACHING PLAN

MAIN POINT 2. Analysis of transactions occurring in the academic environment can lead to improved communications between individuals.

a. Definition of complementary, crossed, and ulterior transactions.
b. Examples of complementary transactions (tape)
c. Examples of crossed transactions (tape)
d. Examples of ulterior transactions

TRANSITION: Thus far, we have examined two of the major concepts of transactional analysis involving individual differences and communications with others. Let's turn to a third major concept, stamp collecting.

MAIN POINT 3. Stamp collecting within the academic environment can adversely affect interpersonal relations.

a. Define stamp collecting
b. Example of newborn baby
c. With age - feelings intensify - stakes get higher
d. Examples - bearing a grudge, pouting, getting even
e. Adults - collect stamps - growing resentment - justification for behavior
f. Small prize - parent/child example
g. Medium prize - runaway, fire valued employee, quit a job
h. Large prize - divorce, mental breakdown, imprisonment
i. Ultimate prize - suicide, homicide
j. Supervisory actions in dealing with stamps
    (1) Burn stamp books
    (2) Destroy black books
    (3) APRs/OERs
    (4) Discuss irritants before resentment begins to build

TRANSITIONS: Thus far, we've seen how the ego state structure explains individual differences, how communications between persons can be analyzed so they can be improved, and that stamp collecting is a process which interferes with interpersonal relations. Let's now turn to a fourth major concept, and perhaps the most important, stroking.

MAIN POINT 4. Stroking can be used as an effective tool for improving interpersonal relations within the academic environment by meeting a student's need for recognition.

a. Story of the warm fuzzies
b. Need to be touched
c. Documentary film Second Chance
d. Need for recognition
e. Debit/credit concept
f. Positive stroking
g. Negative stroking
h. Plastic stroking
i. Examples of stroking

Part II
TEACHING PLAN

SUMMARY: (Main Point 5) Review principles developed in main points one, two, three, and four

Four of six major concepts of transactional analysis represented

Describe scripting process and implications for the classroom

Describe concept of game playing and implications for the classroom

Transactional analysis in the academic environment.

(L.O.) Transactional analysis can be used by instructors to improve interpersonal relations within the academic environment

REMOTIVATION: Importance of interpersonal relations within the military

Importance of the individual in today's Air Force

Role transactional analysis can play in improving interpersonal relations

CLOSURE: Concept of listening as stroke giving - thank students for all the positive strokes.

PART III

TEST ITEMS

LESSON OBJECTIVE: The objective of this lesson is for each student to comprehend that transactional analysis can be used by instructors to improve interpersonal relations within the academic environment.

1. SAMPLE OF BEHAVIOR: Give original examples which illustrate the effective use of transactional analysis to improve interpersonal relations within the environment.

QUESTION: (Multiple Choice)

Which of the following examples BEST illustrates effective use of transactional analysis to improve interpersonal relations within the academic environment? Assume each instructor has just received instruction on key T.A. concepts.

a. Capt Jones recognizes the importance of giving recognition to others. Just as soon as his students turn in their assignments, he comments favorably on the quality of their work. He believes the students will improve their performance if he continually compliments them, although he has to stretch the truth.

b. Capt Jones realizes that the instructors who work for her need to be counseled on their shortcomings. She doesn't want to accumulate feelings about them which would adversely affect their performance ratings. Consequently, she established a policy whereby she counsels subordinates once every three months.

c. Capt Smith believes his communications could be improved through application of the T.A. model. When students send him Child to Parent or Parent to Child messages, he responds Adult to Adult. However, on occasion, when a student sends him a Child to Parent message, he responds Parent to Child in an attempt to keep lines of communication open.

KEY: c

2. SAMPLE OF BEHAVIOR: Summarize concepts developed from transactional analysis theory that can be employed to improve interpersonal relations within the academic environment.

QUESTION: (Essay or Short Answer)

In 100 words or less, summarize the concept of stroking within the context of improving interpersonal relations in an academic environment. Include one short, original answer. This question is worth 10 points and will be scored on content only. No partial credit will be given.

KEY: Students should define stroking in their own words and describe its characteristics. One brief, original answer should be included.

3. SAMPLE OF BEHAVIOR: Defend the use of transactional analysis as a management tool for improving interpersonal relations within the academic environment.

QUESTION: (Essay)

In 500 words or less, defend the use of transactional analysis as a management tool for improving interpersonal relations within the academic environment. The question will be scored on content only (40 points total). Partial credit will be given.

KEY: The student should explain why (1) an understanding of individual differences from the T.A. perspective, (2) an analysis of transactions, (3) elimination of negative stamp collecting, and (4) the proper use of stroking can improve interpersonal relations within the academic environment. Ten points should be awarded for adequate coverage of each of the four principles developed.

Chapter 14

THE GUIDED DISCUSSION METHOD

Discussion is one of the most used teaching methods in civilian and military educational institutions. One type, the "guided discussion," is an instructor-controlled group process in which students share information and experiences to achieve a learning objective. A guided discussion is different from "free" discussion and a "peer-controlled seminar." Like the "bull session," free discussion can be valuable for brainstorming or as a management aid, but it seldom supports measurable objectives. The peer-controlled seminar relies on qualified students to lead discussion among peers which may significantly reduce the likelihood of reaching the learning outcomes.

In a guided discussion, the instructor carefully plans the lesson to reach desired learning outcomes. The group interacts in response to questions, and the instructor refrains from entering the discussion as an active participant. Students are encouraged to learn about the subject by actively sharing information, experiences, and opinions. The flow of communication is a transaction among all the students rather than recitation and response between individual students and the instructor. Questioning and summarizing skills become critical as the instructor guides the students to the lesson objective.

In the sections that follow, the guided discussion will be treated in terms of a teaching method with a set of teaching skills that differentiate it from other teaching methods.

SELECTION AND PLANNING FACTORS

Proper consideration of selection and planning factors contributes to the success of guided discussions. Some of the most important factors follow.

Lesson Objectives

The discussion method is a superior method for teaching more complex cognitive and affective objectives. Thus, the method is appropriate for promoting the understanding of concepts and principles and the development of problem solving skills. It is inappropriate for transmitting knowledge level material where lectures or readings are more efficient.

The degree of consensus in a subject area is also an important consideration. In some subjects there is a high degree of consensus among authorities in the field because of established concepts, principles, laws, and factual information. In such subjects the objective is to communicate these facts, concepts, and principles to students. Thus, Air Force instructors in civil engineering, nuclear physics, mathematics, and highly technical subjects might find forms of one-way verbal communication such as the lecture method more appropriate. They might also use individualized instruction or the demonstration-performance method in achieving lesson objectives.

If authorities in a field have a low degree of consensus, or if there are two or more widely held schools of thought, the guided discussion method is a very appropriate way to achieve lesson objectives. In such subjects the experts do not always agree. Concepts and principles differ considerably from one school of thought to another, and controversy often exists. Air Force instructors who give instruction in history, management, leadership, financial management, logistics, and USAF organization, for instance, will find many objectives which lend themselves to guided discussion. Through discussion, students begin to understand the controversy and differing points of view. They have the opportunity to develop and defend a logical position of their own.

Another consideration is the needs of particular students. If your students need to develop the ability to think critically in appraising the ideas of others, the guided discussion method works well. Students also get the opportunity to reason together and to develop group decision-making skills. In the discussion, they learn to evaluate ideas while listening to others, to formulate their own ideas, and to present and defend these ideas in the process of achieving an instructor's planned learning outcomes.

The guided discussion may also be effective in changing student attitudes and their behavior. Research in social psychology supports the position that discussion is more effective than the lecture for achieving such objectives. When students make a public commitment in a discussion, they are more apt to follow through with a change in behavior. Instructors in fields such as religion, social actions, and safety will find the guided discussion method serves as an effective tool for modifying attitudes and behavior of Air Force personnel.

Group Size

If the instructional objective lends itself to the guided discussion, the next consideration is group size. With one student, individualized instruction is appropriate. With over 40, the lecture method is typically used. When the number is 20-40, instructors may find that a combination of methods works best. For instance, a combination lecture-discussion is often used. When the students number 2-20, the guided discussion method is frequently used. The smaller the group, the more the opportunity for each student to participate. Reticent students may not participate at all when the group becomes too large. Five to seven students would seem to be the ideal size, but few instructors will have such a low instructor/student ratio in their classes.

Time Available

Instructors should keep in mind the relationship between group size and time. As group size increases, so should the time available for discussion. Ideally, enough time should be scheduled for the contributions of all members to be heard and discussed, but this goal may not be achieved even with groups of five to seven students. When costs are a significant factor and a given amount of material must be covered in a short time, the teaching lecture may be more efficient than the discussion.

Instructor Personality

Some instructors have personalities which are better suited to the guided discussion than others. When this method is used, instructors must be willing to relinquish some of their authority over the lesson. Instead of presenting material directly to students, they must be confident in their ability to use questions and other control devices skillfully and to develop the concepts and principles based upon student input. If your lessons must be highly organized, tightly controlled, and instructor centered, then you will have difficulty using the guided discussion. Similarly, if you have difficulty following the twists and turn of a discussion without losing track of the argument, losing patience with its complexity, or in pulling scattered points together in summaries to reach conclusions, the discussion method may be difficult for you to use successfully.

Establishing a Common Base for the Discussion

Prerequisite knowledge. If you decide to use a guided discussion after considering these factors, your next planning consideration is to establish a common ground for the discussion. Students should be at least at the knowledge level on discussion topic when they are asked to engage in a guided discussion. Lectures, programmed texts, reading assignments, films, and field trips can provide basic knowledge. Guided discussions conducted near the end of a block of instruction should be based upon a consideration of the common ground established prior to the discussion.

Use of a problem. One way to make sure that students in a discussion group are able to sustain a worthwhile discussion is to give them a problem or short case to read or view in advance. This problem, along with knowledge students already have, should keep the discussion on track and productive. The problem is usually a printed paragraph or two which illustrate the concept or principle under discussion. Unlike a higher level case study, we are not yet attempting to apply specific principles to solve complex problems. Guided discussions around a problem are designed to develop a comprehension of concepts and principles, with the problem providing the discussion vehicle. The techniques for leading this type of discussion are essentially the same as those described throughout this chapter.

Planning the Room Arrangement

Because of its effect on group dynamics, room arrangement is an important factor in a successful guided discussion. (An understanding of group dynamics is also a prerequisite for maximizing learning in a guided discussion. See Chapter 28.) Research shows that eye contact is one of the most important variables in conducting a successful guided discussion, since direct visual contact between members of a group increases communication. Therefore, a circular arrangement is recommended in which no one is placed in a position of dominance, and each member can establish direct eye contact with each of the other members. With tables, an arrangement involving a pentagon, hexagon, or octagon also works well. Avoid rectangles which tend to put those at each end in a position of authority. To foster group discussion, instructors should avoid placing themselves in a position of authority where student eye contact (and most student comment) is directed toward the instructor. Instead, the instructor should become a group member without relinquishing control.

ORGANIZING THE GUIDED DISCUSSION

Once you have considered the planning factors and have decided to use a guided discussion, you are ready to develop the lesson plan. Note the sample lesson plan at the end of this chapter. The first page, Part I, lists such things as lesson title, references, statement of the lesson objective, main points, and samples of behavior. Assistance in developing this part of the lesson plan is provided in the lesson planning chapters. Therefore, attention in this section is directed toward preparation of the Part II, the actual teaching plan.

Introduction

A guided discussion is introduced in a way similar to other teaching methods with attention, motivation, and overview steps. (See Chapter 6.) However, the overview is especially important to the success of a guided discussion and deserves further comment.

A good overview will pinpoint the topic for discussion and the key areas to be developed. If the topic is motivation, the two key areas for discussion might be extrinsic and intrinsic motivation. The student should be told what will be discussed, and the overview should be shown visually on a chart, blackboard, or handout. The overview visual should be available throughout the lesson to aid students in following the lesson organization and to assist the instructor in summarizing and transitioning between main ideas. A lesson overview also provides the instructor with an opportunity to review with students pertinent information already known or understood about a subject. Terms or concepts should be defined or clarified to prevent confusion, and students should be made to feel that their ideas and active participation are wanted and needed.

Development

You may wish to refer to the lesson plan at the end of this chapter to follow key aspects of the development phase of the lesson plan.

Lead-Off Questions (LOQs). The first item listed on the plan under development is the concept or principle you are teaching. How can you best lead your students to an understanding of this concept or principle? The logical reasoning process starts with the LOQ.

To develop a concept, you might start the discussion with a LOQ which calls for a definition of the concept, such as "How would you define prejudice?" If you have already provided the students with a definition in your introduction, your LOQ might focus on the attributes (characteristics) of the concept, such as "What behaviors might we expect from a person who was prejudiced?" Follow-up and spontaneous questions will be used to further the development of the concept.

To develop a principle, you might rephrase the principle as a how or why LOQ. For instance, if your main point was "An authoritarian leadership style is appropriate in crisis situations," your LOQ might be "Why is the authoritarian leadership style appropriate in crisis situations?" This question will identify supporting points for development through spontaneous and follow-up questions.

Another acceptable approach for developing a principle is to ask a LOQ based upon a key supporting point. If this approach were used with the principle just cited, you might ask "How would you describe the authoritarian leadership style?" Additional supporting points would be developed which contribute to development of the principle.

Follow-up Questions (FUQs). Once your LOQ is identified, you must develop appropriate FUQs. If a concept is being developed, FUQs will ensure that characteristics, examples, and nonexamples of the concept are developed. When principles are taught, FUQs will be planned for key supporting points which are important in the logical development of the principle. Since guided discussions are normally conducted at the comprehension level, little time should be devoted to FUQs written at the knowledge level unless they are necessary for establishing a base for the discussion. Instead, questions dealing with "how," "why," and "what effect" should be used. Knowledge level facts can often be given in the introduction or in a handout.

Anticipated Responses. Notice the right column on the sample plan. By listing anticipated responses, the instructor is forced to think about possible answers students might give. Leave space in the right column after the anticipated responses of each subpoint so you can write in additional responses of students for use in your summaries. As an alternate recording method, you may wish to list the student responses on an overhead transparency or a sheet of paper for use in summarizing. If the lesson plan is to be used again, the best student responses can later be added under anticipated responses.

Transitions. Since the instructor is working toward desired learning outcomes in the discussion, major transitions can be planned in advance of the discussion. A good transition reviews the key point just made, reminds the students of the central idea (lesson objective), and introduces the next point. (Note the transitions on the sample lesson plan at the end of this chapter.) Transitions written on the lesson plan serve as a good jog to memory each time the lesson is taught.

Planned Summaries. If the guided discussion has a single conclusion you are working toward (single objective), then comprehension level summaries will occur after main points in the discussion. If the lesson has more than one objective (multi-objective), then comprehension level summaries will occur after each main point and objective. These comprehension level summaries are not tightly planned but develop primarily from student contributions. However, you can mention planned anticipated responses which were not discussed. Also, you may add additional support material in the summaries in the form of examples, statistics, and expert testimony to aid students in achieving lesson objectives.

The Conclusion. The conclusion to a guided discussion has three parts as discussed in Chapter 6. Remotivation and closure are planned as are certain aspects of the summary. When a multi-objective plan is taught, only a brief restatement of the objectives is required. When a single objective is taught, a comprehension level summary is required in the conclusion. Additional support material can be introduced from the lesson plan to insure achievement of the lesson objective.

Once the lesson is planned and organized, the instructor is ready to conduct the lesson.

CONDUCTING A GUIDED DISCUSSION

A number of skills are involved in conducting a guided discussion. The most important ones follow.

Controlling

How active should your role be in the discussion? You can do most of the talking (which results in overcontrol), you can remain almost silent (which usually results in undercontrol), or you can find an active intermediate role. You define your role since you are the instructor. However, the more you talk the less students can talk and the less will be the benefit of using the guided discussion method. Thus, it is wise to limit your role to that of questioning, clarifying, probing, and summarizing.

As discussions with new groups begin, students will look to you for a definition of your role. While you may tell them what your role will be, your actions will be closely observed. Eye contact of group members will give you good feedback on your control. If all eyes turn to you as the instructor when silence occurs, perhaps you are exercising too much authority in the discussion. An analysis of lines of communication (sociogram) will also provide valuable feedback. Have a student plot the lines of communication on a piece of paper. If the lines of communication usually flow back and forth between you and the students rather than among the students, then you are probably overcontrolling the discussion.

If you undercontrol the guided discussion, you may never reach your desired learning outcomes. Minimal instructor participation may result in excessive disorganization or aimlessness. Aimless discussion can quickly lose the respect of students and have a negative effect upon their motivation to learn. To prevent this deterioration in the discussion, the instructor must judge quickly and accurately when intervention is necessary.

As a guideline, remember that there are desired learning outcomes to be achieved in a designated period of time. Proper control will ensure maximum student participation in achieving each of these desired learning outcomes in the time allotted.

Questioning

An instructor who is going to be successful in conducting a guided discussion in which desired learning outcomes are achieved must have an understanding of questions and the role they play in this method. (See Chapter 11 for detailed coverage of questions and their uses.)

Lead-Off Questions (LOQ). The instructor opens the discussion by asking a prepared LOQ and then waiting for a response. The students must be given a chance to react. The instructor has the answer in mind before asking the question, but a student must think about the question before answering. Avoid asking two questions at once, questions requiring a yes/no response, and complex questions which leave students confused.

The discussion begins with the first student response to the LOQ. The instructor should listen attentively to the ideas, experiences, and examples contributed by the students. As the discussion proceeds, the instructor guides the direction of the discussion, stimulates the students to explore the subject in depth, and encourages them to discuss the topic in detail by using both planned and unplanned (spontaneous) follow-up questions.

Spontaneous Questions. As the name implies, these questions cannot be planned, but they serve a very useful purpose. When a LOQ or FUQ is asked, the instructor can never be sure of the response students will give. The discussion may start to wander in ways the instructor had not anticipated and the spontaneous question can get the discussion back on track. While the instructor hopes that in-depth comprehension level support material will develop, the opposite may be true. Consequently, to develop the topic properly, the instructor uses spontaneous questions. Direct questions which bring reticent students into the discussion may be spontaneous and are based upon an observed need. Spontaneous questions also work well when the instructor wishes to probe for more information or to seek clarification of a point.

Summarizing

One of the key skills involved in conducting a discussion is summarizing. You should plan for summaries to occur after discussion of main points and objectives. Unplanned summaries occur because of need and may be used periodically to designate relationships, to get students back on track when the discussion wanders, or to transition between subpoints. No matter when you summarize, use ideas developed by the group which support achievement of your objectives. Try to use the words of the students and show how their ideas have developed the learning outcomes.

Not all student contributions will support a lesson objective nor will you have time to cover each student response. Therefore, avoid crediting students by name for their contributions or making quality judgments about the various responses. Such comments may cause certain students to wonder why their contributions were ignored or treated differently. Consequently, they may participate less and open discussion is stifled.

After summarizing students' contributions, additional support for a main point or objective may be needed. At this point you should introduce new support material which will aid in achieving the learning outcome.

Knowing When to Intervene

As you develop your skill as a guided discussion leader, you will become more skillful in knowing when to intervene in your role as questioner, clarifier, prober, and summarizer. These guidelines might prove helpful:

1. If several contributions in a row indicate a drift away from the main or subpoints, then a brief interim summary followed by a spontaneous or follow-up question may be appropriate for getting back on target.

2. If pauses between contributions become too long, there are three possible causes. The participants may be confused, your question was not clear in starting the discussion, or perhaps the students have no additional contributions in the area. At this point you may want to find out the reason for the pauses by asking a spontaneous question.

3. A student may state an error in fact which seems to be having a negative effect on the discussion. If other students do not correct this error, you should intervene. A probing question or asking a student to clarify what was said may suffice, but the error should not be allowed to stand.

4. Watch to see if serious fallacies in reasoning are going undetected. If so, the fallacies should be pointed out before they

have a chance to damage the validity of the discussion. For instance, the students may be divided along two extremes on an issue (black and white fallacy) and be unable to see that a reasonable course of action exists between the extremes. Or students may omit important facts or distort and arrange evidence in a special way to make a point (stacking the evidence). While analogies might be helpful in suggesting new ideas or in illustrating a point, students should not use them to prove a point (misuse of analogy). Generalizations may be reached based upon insufficient evidence or instances supporting an opposing point of view are ignored (hasty generalization). Several fallacies in reasoning and some emotional appeals that could interfere with the development of a good guided discussion are explained in Chapter 8, AFP 13-2, A Guide to Air Force Writing.

Dealing with Nonparticipation

What happens if you ask your LOQ and nothing happens? Several possibilities exist. Perhaps you have not clearly established a context for the question in your introduction. The question may be double-barrelled, too long, or confusing. Students may not understand their role in the discussion or they may be afraid to say anything because of an authoritarian role you have taken in previous discussion. The question may simply be one that requires some thought before giving a reply. Try waiting out the silence for several seconds. At that point you may need to ask the group what the silence means, or repeat the question. If the question does not work successfully, be sure to change it on the plan before conducting the discussion again with another class.

Another problem is uneven distribution of responses. Certain students may refrain from discussing a particular topic or any topic presented for discussion. Other students may tend to monopolize the discussions. Through awareness, the instructor can take certain actions to gain more participation by nonparticipants. The direct question and relay questions to nonparticipants can be used to draw them into the discussion. By avoiding eye contact with the active participants when a question is asked and focusing on others, the quieter members can be encouraged to reply. By giving positive reinforcement for contributions of nonparticipants (when such recognition is appropriate), they often can be encouraged to participate. Tying the quiet student's ideas to other ideas and referring to these ideas often is a kind of positive reinforcement that has been found repeatedly to promote achievement and favorable attitudes. Head nods and positive remarks such as "Good point!" and "That's interesting!" reinforce a person's contributions, while frowns and withholding reinforcement suppress the responding of group members.

Dealing with Hurt Feelings

As you gain more experience with the guided discussion, you will become increasingly aware of student feelings in a discussion. Instructors should insure that student feelings are not hurt unnecessarily. Sarcasm and ridicule have no place in a guided discussion, whether from the instructor or other students. By example and guidelines if necessary, the instructor should rule personal attacks out of order. On the other hand, group members should be encouraged to accept criticism or correction without taking it personally. Mature students should be able to learn to accept valid criticisms of their ideas without being irrationally defensive about them or themselves. Instructors can help by acting in a rational and nonemotional way to criticisms of their own ideas.

Avoid Biasing the Discussion

Instructors must be constantly reminded of the power they have in the classroom. Casual mention of their own opinions, attitudes, and beliefs will influence some class members. Over a period of time students have honed their senses to be able to detect what the instructor wants. The instructor must be careful that opinions expressed do not close discussion or force student conformity.

Avoid Encouragement of Yielding

Groups exert enormous pressure on members to conform. The instructor and one group of students may agree on something and through group pressures try to get the other students to conform. Guided discussion leaders should encourage the expression of minority points of view. If the instructor insists on unanimity of opinion, then minority views will be stifled and the discussion will suffer.

Avoid Withholding Crucial Information

At times the discussion may suffer from the lack of a fact, definition, concept, or principle. It is not wrong to share your expertise with the group when the discussion would profit by it. However, you should not use the expertise if your only goal is to enhance your own image of competence in the eyes of students.

Avoid Sticking to a Dead Topic

When students have exhausted a topic, the instructor should be prepared to move on with a short interim summary or a new question. A dead topic is one which no longer helps achieve your objective. Signs of a dead topic include periods of silence, repetition of points already made, boredom, or inattention. Normally, you should not let a discussion get to this point before you intervene.

POST DISCUSSION ACTIONS

After the lesson is complete, you should go back to your lesson plan to make notes and then evaluate the discussion.

Annotating the Lesson Plan

While the material is still fresh in your mind, annotate your lesson plan. If unanticipated material entered the discussion, make note of it on the plan. If certain questions did not work well, rewrite them or eliminate them. Perhaps you became aware of points or definitions that would have aided the discussion if they had been covered or clarified in the introduction. Now is the time to make such annotations or corrections on your lesson plan. It is important to establish records on the plan which allow you to improve your instruction.

Evaluating the Discussion

After the discussion has been completed, you should take time to evaluate its effectiveness in achieving your lesson objective. Did students have the required knowledge to discuss the topic adequately? Should the reading assignment be changed or is there some better way to get students to the knowledge level prior to the discussion? If you or another student maintained a diagram of the discussion, what do the lines of communication say? Such evaluation may be subjective but still valuable in improving instruction.

More formal evaluation comes when tests are administered. When you develop test questions, you will have direct evidence of how well the guided discussion achieved your lesson objective. Such evidence will also allow you to make required changes to the lesson plan for better reaching your objective.

SUMMARY

The guided discussion is a teaching method in which students learn by sharing experiences and opinions with each other. The instructor carefully plans the lesson to reach desired learning outcomes and then guides the discussion through questioning and summarizing.

Student needs should be considered when planning the guided discussion. The discussion method is effective in teaching cognitive and affective objectives. It helps students develop skill in group reasoning and problem-solving and in facilitating changes in attitudes and behavior. Instructors should use the guided discussion when group size is from 2-20 students (5-7 students is optimum) and when there is sufficient time for all students to participate. The classroom should be arranged to allow maximum eye contact among students, and each student should have a basic knowledge of the subject before the discussion begins.

The guided discussion is organized to encourage maximum student participation. In the overview the instructor tells students what will be discussed, gives any necessary definitions or concepts, and encourages participation. Carefully planned lead-off and follow-up questions then elicit this participation. The instructor also anticipates possible student responses and includes these in the lesson plan. Although remotivation and closure are planned, the final summary is developed using inputs from the students.

Certain specific skills are needed to conduct a successful guided discussion. The instructor controls the group so that discussion flows among the students. Lead-off and follow-up questions are asked as they were planned, but spontaneous questions should also be used frequently to clarify student responses and eliminate errors in fact and reasoning. The instructor should avoid biasing the discussion or withholding necessary information from the students. All students should be encouraged to participate, and positive reinforcement should be given to student inputs.

LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Situational Leadership
INSTRUCTOR: Captain Jones
TEACHING METHOD: Guided Discussion
REFERENCES: Gibson, J., Ivanovich, J., and Donnelly, J., Jr., Organizations: Structure, Processes and Behavior; Hersey, P., Blanchard, K. Management of Organizational Behavior.
AIDS/HANDOUTS: Overview Chart

PART IA

LESSON OBJECTIVE: The objective of this lesson is for each student to comprehend that the management situation dictates the leadership style in military settings.

SAMPLES OF BEHAVIOR:

1. Explain why the management situation dictates the leadership style in military settings.

2. Predict the outcome of applying an inappropriate leadership style in a given military management situation.

3. Using an example not discussed in class, defend the use of a particular leadership style in a given military management situation.

4. Defend the assertion that within a given military management situation, it may be appropriate for a leader to change leadership styles.

5. Given a military management situation, compare the outcomes if differing leadership styles are used.

PART IB

ORGANIZATIONAL PATTERN: Topical

STRATEGY: Two specific situations will be discussed to develop the generalization stated in the lesson objective. The students have already studied the concepts of authoritarian, democratic, and laissez-faire leadership. Since crisis situations in the military have normally been handled through authoritarian methods, this relationship will be examined first. Democratic leadership in military settings is of more recent origin so the relationship to routine management situations will be developed second. Additional support material will be introduced in the final comprehension level summary to aid in reaching the generalization in the objective. Main points will be developed going from general to specific to general. Lead-off questions will generate key points for follow-up discussion. Key points will be brought together in the comprehension level summaries.

LESSON OUTLINE

Main Points/Subpoints

1. (C) Crisis situations in the military often require use of an authoritarian leadership style.
    a. The time element often forces use of an authoritarian style.
    b. The personnel involved often force use of an authoritarian style.
    c. The circumstances involved often force the use of an authoritarian style.

2. (C) Routine situations in today's military most often require a democratic style of leadership.
    a. Military training situations often demand a democratic style.
    b. Everyday operations in an operational unit often benefit from democratic leadership.
    c. Routine administration improves when democratic leadership is used.

3. (C) The management situation dictates the leadership style in military settings.
    a. Review main points.
    b. Indicate the relationship among the main points.
    c. Provide additional support for the lesson objective.
    d. Draw the conclusion stated as the lesson objective.

PART II
TEACHING PLAN

INTRODUCTION
(5 min)

ATTENTION: Differing concepts of leadership focus around two theoretical approaches: (1) the trait theory, and (2) situational theories.

Yesterday, we discussed the trait theory. We saw three major weaknesses. First, trait theory fails to consider the influence of situational factors. Second, the search for universal traits in leaders has been unsuccessful. Third, the degree to which managers possess given traits has proved hard to measure and predict.

Today we focus on the situational approach which emphasizes the existence of leadership roles and skills that are evoked by situations.

MOTIVATION: Leadership is vital to the survival of military organizations.

Persons capable of exercising effective leadership in organizations are often in short supply relative to the tremendous need for them.

Leadership can be learned and developed in military organizations.

The more we understand leadership, the more we are able to foster its development in ourselves and others.

OVERVIEW: In today's lesson we will discuss various situations in which military leaders find themselves and see how these situations might relate to leadership styles.

1. First we will discuss the relationship between crisis situations and an authoritarian leadership style.

2. Next, we will discuss the relationship between routine management situations and the democratic style of leadership.

3. Finally, we will draw some conclusions about relationships between military situations and leadership styles.

Support will come from you. Your personal experiences are a valuable form of support. Also share pertinent material from your outside readings.

TRANSITION: Throughout history, military leaders have had to deal with crisis situations. Traditionally, the authoritarian leadership style has been used. So let's begin our discussion with crisis situations.

DEVELOPMENT
(26 min)

INSTRUCTOR ACTIVITY	ANTICIPATED RESPONSES
1. Crisis situations in the military often require use of an authoritarian leadership style. (13 mins)	
a. LOQ: Why do crisis situations in the military often require use of an authoritarian leadership style?	*Time is the critical element *Problems with personnel involved *Circumstances dictate the style (Most student responses will fall within these three categories)
b. FUQ: In crisis situations, how can the time element force a leader to use the authoritarian style?	*Unit under attack *Emergency is developing *Safety of others involved *High threat exists *Pressure from above for a decision
c. FUQ: How might the personnel involved in a crisis situation force the leader to use the authoritarian style?	*Acting confused or irrational *Panic has set in *Inexperienced or immature *Lack of technical expertise
d. FUQ: What other circumstances might require a leader to use the authoritarian style in a crisis?	*Classified information involved *Other styles have failed to accomplish objective

INTERIM SUMMARY:

1. Summarize student ideas that support the first main point using the terms of the students.

2. State first main point: "Crisis situations in the military often require use of an authoritarian leadership style."

TRANSITION: We can see that there are crisis situations in which the authoritarian leadership style is most appropriate. However, there are many situations where the authoritarian style of leadership is not the most appropriate style. The negative effects may far outweigh any gain. Let's examine some management situations in the military where democratic leadership is more appropriate.

INSTRUCTOR ACTIVITY	ANTICIPATED RESPONSES
2. Routine situations in today's military most often require a democratic style of leadership.	
a. LOQ: Why do routine management situations in today's military most often require a democratic style of leadership?	*Commanders cannot be experts in all areas of today's technology *Subordinates in training need involvement in decision-making *Operational units need to develop cooperation and loyalty that are best produced by democratic leadership *Best people may leave service in peacetime if they don't participate in the decision-making *Today's young people want to participate and know "why" something is done *Decisions must be made when boss is absent *Expertise of several people often required in decision-making process
b, FUQ: Why do most military training situations demand a democratic type of leadership?	*Personnel must be involved and learn how to make decisions as part of training *Cooperation between services and units must be fostered *Morale and motivation are important considerations in training situations
c. FUQ: How do operational units involved in day-to-day operations benefit from democratic leadership?	*Personnel learn that their lives and safety are not dependent on one person *Cooperation among members is stimulated *Loyalty to the unit develops *Personnel become more productive *Personnel learn to look out for boss instead of trying to sabotage efforts
d. FUQ: How does routine administration improve when democratic leadership is used?	*Personnel tend to be more creative *Morale is higher *Personnel experience more job satisfaction

TRANSITION: Let's stop at this point and review today's lesson to see what conclusions we might have reached.

CONCLUSION
(5 min)

FINAL SUMMARY:

3. The management situation dictates the leadership style in military settings.

*Summarize student inputs to MP 2. Add anticipated responses, if necessary.
*Restate MP 2 - "Routine situations in today's military most often require a democratic style of leadership."
*Summarize student inputs to MP 1. Add anticipated responses, if necessary.
*Restate MP 1 - "Crisis situations in the military often require use of an authoritarian leadership style."

*We must recognize that whether a situation is routine or a crisis is a matter of degree. Similarly, being autocratic or democratic is a matter of degree. Both situations and styles of leadership are on a continuum. But as a result of our discussion I believe we can agree that "the management situation dictates the leadership style in military settings."

*Quote and summarize information from Dr. Fred Fiedler - social scientist.

*Additional examples of other situations which call for varying types of leadership.

*Restate lesson objective--"The management situation dictates the leadership style in military settings."

REMOTIVATION: Every military organization needs strong and able leaders at all levels.

Dull, lifeless, and unimaginative leaders will allow abilities to lie idle and ideas to go untried. The military will suffer.

As present and future military leaders, we need to understand leadership as best we can and then apply this understanding to further the mission.

Today's lesson should further our insights and understanding of the leadership process.

Tomorrow we will see how a theory of leadership can and probably should involve both traits and situations.

CLOSURE: But for now, if someone asks you which leadership style is best, I hope you will reply: "It all depends on the situation."

PART III

TEST ITEMS

LESSON OBJECTIVE: The objective of this lesson is for each student to comprehend that the management situation dictates the leadership style in military settings.

1. SAMPLE OF BEHAVIOR: Predict the outcome of applying an inappropriate leadership style in a given military management situation. (Given a military management situation involving leadership and three possible outcomes as alternatives, select the alternative which predicts the most probable outcome of applying an inappropriate leadership style.)

QUESTION: (Multiple Choice)

Captain Able was a hardworking officer who possessed a strong sense of duty. His loyalty was unquestionable and he demanded excellence of himself and others. He had enough self-confidence to believe he knew all the answers, so he tended to manipulate others and to be domineering and overpowering no matter what the situation. While in Vietnam he commanded a unit that engaged in direct combat with the enemy, and he was highly decorated for his leadership. After the war he was reassigned to a stateside training base and put in charge of a school which developed middle managers. From the situational leadership perspective, how will his leadership style most probably affect the morale and motivation of his subordinates in the training situation? Overall morale and motivation among subordinates will most probably be:

a. High
b. Low
c. Unpredictable based on information given.

KEY: b

2. SAMPLE OF BEHAVIOR: Defend the assertion that within a given military management situation, it may be appropriate for a leader to change leadership styles. (Given the requirement to defend an assertion that within a given military management situation it may be appropriate for a leader to change leadership style, write an acceptable defense.)

QUESTION: (Essay)

In 100 words or less, defend the assertion that within a given military management situation, it may be appropriate for a leader to change leadership style. This question is worth 10 points and will be scored on content only. No partial credit will be given.

KEY: The student should explain the need for flexibility in leadership based upon the situation. As circumstances change, so may the leadership requirements. Crisis situations often require a different leadership style from that required in routine management situations. The effective leader understands the relationship between the situation and the leadership style. This question is worth 10 points and will be scored on content only. No partial credit will be given.

3. SAMPLE OF BEHAVIOR: Explain why the management situation dictates the leadership style in military settings. (Given the requirement to explain why the management situation dictates the leadership style in military settings, write an acceptable explanation.)

QUESTION: (Essay)

In 500 words or less, explain why the management situation dictates the leadership style in military settings. The question will be scored on content only (40 points total). Partial credit will be given.

KEY: Two areas should be developed in depth. (1) Crisis situations in the military often require use of an authoritarian leadership style. Under this division, students should discuss the time element, the personnel involved, and unique circumstances which might dictate an authoritarian leadership style. (2) Routine situations in today's military most often require a democratic style of leadership. Under this division, students should discuss military training, everyday operational, and routine administrative situations.

Chapter 15

THE CASE STUDY METHOD

The case method presents students with real life challenges. It helps bridge the gap in the classroom between theory and practice by applying previously learned concepts and principles.

Some Air Force schools teach manual tasks, the practice of a job--missile operations, for instance, or vehicle maintenance. Usually, the more specific the task to be learned, the more closely the school tends to fit job requirements. Theory and practice come together. Engine mechanics, for instance, are trained on actual engines or mock-ups in shops similar to those on the job.

Other schools teach abstract or mental skills, the theory of a job--like strategies for limited warfare or an aspect of professional military education. In schools where the subjects are abstract, however, students tend to be less involved with the specific tasks they will encounter later on the job. Theory and practice may be far apart. The curriculum of an NCO leadership school, for instance, does not relate directly to NCO specialty codes. Bridging the gap between school concepts and reality is thus a challenge to many Air Force instructors.

Using case studies is one approach to teaching we can use in meeting this challenge. In the case method, students meet a simulated, real-life situation in the classroom in order to achieve an educational objective. The case study, typically written, is an account provided to students, usually as a homework assignment, which serves as a basis for class discussion. Most commonly, a case will describe a problem already faced by others in a given field. The greatest value of the case is that it challenges students to apply what they know and comprehend to a realistic situation. Case method takes students out of the role of passive listeners and makes them partners with the instructor in applying the concepts and principles under study. The method enables students to think, reason, and employ data in a logical fashion, just as they will in a real job.

The case method is a flexible teaching approach. It can be the basis of an entire curriculum, a course, or simply an individual lesson. While the case method is versatile, there are times when other teaching methods are suggested in lieu of the case approach. Case method may not work with students who are immature or with large classes. The method is not applicable in situations where students are learning a procedure or a single solution which has been accepted as "correct." Cases do not lend themselves to development of objectives at the knowledge level, where the lecture and reading are usually more efficient. But once the knowledge level of learning has been achieved, the case is an excellent way for students to progress to the higher levels.

Variations of the case method were first used in teaching medicine and law, but over the years, the case has been widely used in the study of business, management, and education. The method can be used in almost any learning area that can draw cases from real situations for study and discussion.

Teaching Value and Limitations. A principle advantage of the case is to provide students experience in solving problems. Many students can repeat isolated facts or principles, but they have difficulty in interrelating these facts and principles. The case method provides an opportunity for them to gain experience in making decisions and in working with other people. It exposes them to a number of different approaches to the solution of problems. As they learn various problem-solving techniques, they make their mistakes in the classroom and not on the job where an error is much more costly.

Students learn by encountering situations from real life instead of listening to lectures or reading theoretical descriptions of the solution to problems. By interacting with others, they learn to respect the opinions of others. Because the case may not list all pertinent facts, they also learn how to cope with ambiguity and uncertainty. As with real life, we sometimes ask questions and get answers--and at other times we can only ask questions.

TYPICAL CASE APPLICATIONS

Because of its versatility, the case lends itself to a wide variety of teaching conditions.

Case courses. Some schools use the case method exclusively, especially graduate schools of business. The assumption is that the best way to prepare for a business career is to have experience in analyzing data and making decisions. Students in these courses are given complex cases to analyze and to solve. The quality of the analysis and the reasoning behind the suggested decisions are often more important than arriving at a single solution. In the classroom, students participate in collective analysis and decision-making. As more and more cases are analyzed, students begin to form generalizations which they can apply to new situations. Cases thus substitute for a period of training on the job.

Normally in the case course, concepts and principles are not taught directly. Instead, they emerge gradually as students are forced to formulate theories to support their case decisions. Because these theories arise from practical work with problems, students remember them better and are able to recall them for similar solutions.

The case course is usually conducted using group problem solving techniques in open class session. But the case may serve as an out-of-class written assignment, with students asked to bring solutions to class along with a rationale for their decisions. These solutions may form the basis for class discussion, and may also be turned in for the instructor to grade. A variation like this may overcome the need for relatively small classes in pure case method.

Capstone method. A case or a series of cases are often used at the end of a body of instruction to help show the application of the course content. Often a course will proceed by lectures, discussions, and other more usual methods. Towards the end of the instruction, students will apply what they have learned to a series of cases specifically designed to support the course objectives. This capstone method is particularly appropriate when students start a lower levels of learning (such as the knowledge level) and are brought gradually to the higher levels (such as the application level). The capstone method is particularly appropriate in Air Force leadership schools where readings and lectures can supply the basic material and case studies can allow an opportunity to practice the theory as a capstone experience.

The Short Case or "Problem." The case also has applications at lower levels of learning. This technique is also called "use of the problem in teaching." A realistic problem situation, often a page or less in length, is used as a discussion vehicle. The instructor plans the lesson much like a guided discussion. For example, the objective of the lesson may be to have students comprehend the management principle of span of control. The instructor might introduce a situation in which a supervisor failed to take this principle into account. A serious accident or a dramatic event might then result.

The primary object is not to find a "correct" solution to the problem posed, but to understand the principles involved. The problem posed should be sufficiently interesting and difficult to involve all the class members for the time allotted. Because the written problem provides the discussion vehicle, the class can also be broken up into smaller discussion groups.

A variant of the short case can also be used in group dynamics exercises where the emphasis is not on solving the problem, but on the interaction of group process. Similarly the short case can be used to demonstrate a decision making process, where the process is more important than the solution arrived at. A series of short cases or scenarios often works for reinforcing affective objectives, in human relations, for instance, or equal opportunity.

TYPES OF CASES

Teaching cases are situations from real life. There is no single format for cases, and great variation in the types of cases can be found. They may vary in length from a paragraph or two through many pages. For convenience sake, types of cases will be discussed in two categories: case format and mode of presentation.

Format

Full Text: A full text case contains all the information the student will need to deal with the situation and requires access to no other source. Business school cases, for instance, often illustrate a real situation faced by managers in the past. They contain the problem to be addressed, how the problem arose, the organization's structure, and the employees involved in the situation, as well as their perceptions at the time of the original incident. Cases of this type are usually of eight to fifteen pages, take considerable time to analyze, and are usually the basis of a case course. Students are required to read the case, perform an analysis, make a decision, and support that decision before their peers. With such a case the instructor is particularly interested in the student's ability to perform an analysis and make a decision.

Another full text case is the abbreviated case, which is much shorter, from one paragraph to several pages in length. An obvious consequence of the length is the diminished content. Since it is shorter, the focus is usually built in and the solution or solutions may be more limited. The abbreviated case may deal with one "problem," or it may define a scenario with a series of limited choices. The abbreviated case may lend itself to lower levels of learning.

A third variation of the full text case is the unsifted case. Although all the data required by students is presented at one time, it is given in an unorganized form (simulating an in-basket), and extraneous information may be included. It is the student's task to select and arrange the information into some meaningful pattern for action.

Partial Text: With partial text cases students are given only limited information about the situation under study, and part of their job is to find or ask for the additional information they need for solution. In the incident-process case the instructor presents a brief incident, and the students are required to take some action, make a decision, or suggest recommendations. The instructor usually provides additional information only when the students request it. If it is not requested, it is not provided. Partial text cases are designed to teach students analysis and problem solving and also the ability to ask the right kinds of questions. The situation parallels real events because we often make decisions based on partial information. The incident-process case is designed to prepare students for this contingency.

In an interactive case also, students receive limited information. Then they interact with other sources for additional data, return to class and ask for additional information or receive another segment of the case from the instructor, return to interaction, and so on. Other sources include additional readings, interviews, and library research. This process is similar to doing a research project. It is an artful blend of dealing with reality, while at the same time acquiring additional knowledge and skill.

Like other partial text cases, the sequential case begins with limited information. The situation unfolds in succeeding installments of information to the students, much like a command post exercise. At the end of each installment, students decide if intervention in the situation at that point is called for or not. Some incidents resolve themselves and intervention will only aggravate the situation. Other incidents continue to deteriorate and might even become irresolvable if intervention comes at an inappropriate time--or even too late. The sequential case is particularly suited for training in personnel management.

Mode of Presentation

Thus far, we have assumed that all cases are written. While the majority of cases do come in this format, other modes of presentation add variety, drama, and realism to the case class. Movies and sound-on-slide presentations can offer the participants the incident and the emotions of the case in a dramatic and lifelike way. Typically the film will unfold the situation to a decision point, when the students take over. After some individual or corporate decision has been made, the presentation can be continued by presenting more information, by using the outcome as an illustration and as a basis for further discussion, or for closure, whichever suits the student and instructor needs.

Videotape cases have the potential of increasing realism by presenting the original case participants who give their perceptions in their own words. How the original participants saw the case is often more critical and important to the student than the interpretations of these perceptions by a case writer. Another step toward case realism is to have a live presentation, where the participants come in person before the class to recreate the case experiences and respond to questions. A variation is to have students meet with the case participant--perhaps in the actual case environment.

CASE METHODOLOGY

More is required in teaching with the case method than simply reading the case and asking a few questions in class. Proper use of the case method requires conscientious preparation, presentation, and follow-up.

PREPARATION

While there is no "best" way to approach case preparation, some generalizations can be made.

The instructor should identify the specific learning objective toward which the class will proceed. Here, also, some appraisal of the relationship between the lesson and the rest of the curriculum is appropriate. Consider the instructor who has taught the principles of management to students during a two-week period. The objective now is to see if they can apply these principles to a given situation. Using the case in this way makes it a "capstone method," as the case reinforces and extends the teaching that has gone before. Most Air Force case teaching uses this approach.

Sources of Cases

Once instructors decide to use the case method, where can they find cases? They can either use a prepared case or write an original one.

Prepared Cases. Because of its long involvement with the case method, the Harvard Business School, through the Intercollegiate Case Clearing House (ICCH), Soldiers Field Post Office, Boston, Mass. 02163, offers the most centralized source of prepared cases. Cases can be ordered from the published catalogue for a nominal fee. The Inter-University Case Program, Box 229, Syracuse, NY 13210, is a similar source of professionally written cases. The Air University Library has an extensive collection of cases which have been used in AFIT and in professional military schools, but some of these cases cannot be released for general use.

The base or community library is also a source of cases. Periodicals such as Academy of Management Review have a regular section devoted to cases. Textbooks in specialized areas often contain cases such as David R. Willings, How to Use the Case Study in Training for Decision Making, or Kenneth R. Andrews, The Case Method of Teaching Human Relations and Administration. Other texts on this same order are also available to the course developer. For film cases available for rent or purchase, see Roundtable's Catalogue of Training Materials.

Case Writing. Quite often the instructor is unable to find the exact kind of case to achieve a specific objective. The solution may be to write a case to fit the specific school need. The idea for a case may come in some current event, an article or periodical, or personal experience. For guidance in case writing, see Case Research: The Case

Process by Leenders and Erskine, James W. Culliton's Handbook on Case Writing available through ICCH, or the Air University publication, AU-1, Volume 7, Case Method and Case Writing.

Case Selection

In evaluating a case for use, regardless of source, we should ask ourselves five questions:

Is it realistic? A case is realistic if it describes an actual problem or situation, even if the organization or participants are disguised. Obviously fabricated or fantasy cases are unlikely to have credibility. If the case is not realistic, it is hard to make the students' solution, decision, or action seem real. While it is theoretically possible to "invent" a case or use a composite of several situations, in practice such an approach is rarely as successful as dealing with an actual real-life case.

Is it meaningful? The case should be meaningful to students so that they are able to identify with it in some way. They must be generally familiar with the problem either through their past experience or in the experiences they expect to face in the future. A case on a moon walk, for instance, may not work for students who are not involved with space travel or who do not have the necessary technical background.

Is it challenging? The case should contain actual or potential controversy. If the case is one in which the solution is obvious, it should be rejected.

Is it complete? The usual case is complete within itself. It presents enough information so that students can deal with the problems without reference to outside sources or the instructor.

Does it provide for a logical difference of opinion? A case study that prompts a single line of analysis may not result in productive discussion. An acceptable case should provide an opportunity for reasonable people to differ rationally.

Writing the Teaching Note

A good case allows both the instructor and student to achieve educational objectives--the instructor to reinforce general principles with specific examples and the student to gain experience from the past in a close to real-life role. These objectives are both met by the instructor's analyzing the case beforehand in what is called a teaching note, which may include:

1. Essential details in the case.
2. Major issues.
3. Analysis of these issues.
4. Evaluation of the case characters (their relationships, goals, values).
5. Prior knowledge students need to work the case.
6. Questions to be included in the lesson plan which will guide the discussion.

The teaching note is not the solution to the case, but it should detail typical student activities which the case will stimulate and define the specific student outcomes the instructor expects. It should also define the level of student for which the case is written and relate the case to readings and to preceding or subsequent classes. The note should include at least an outline of the instructor's analysis of the case to show that it is internally consistent and able to hold up under analysis. After writing the teaching note, instructors will often find that the case contains insufficient or misleading information, and they may want to revise or amend before giving the case to students. For certain groups, the case may assume knowledge of a process or background material which may need to be summarized in an attachment. A case on discrimination in promotion, for instance, may depend on a detailed knowledge of the promotion system and its appeals which the average social actions specialist may not have.

The instructor's preparation, then, should extend beyond the limits of the case to include political, economic, or social factors; policies and procedures in effect at the time of the case; and concepts and principles alluded to but not explained in the case. The more expert the instructors are about a case, the greater the chance of teaching it successfully, especially if the subject area is unfamiliar or the details skimpy.

Lesson Format

Before the actual lesson planning begins, the instructor must select some logical sequence for analyzing the case. Often an analytic format will be inherent in the concept, principle, or objective the case is to reach. If so, the concept, principle, or approach may serve as the lesson objective, and its format, as main points in the lesson plan. These main points also become the procedures the students will use to develop the lesson during the class period. They also might well be used as broad categories to be outlined on the chalkboard during the class to help with lesson development. The following is an example of this process:

Lesson Objective: "...for the students to apply Gelatt's decision-making model to given situations."

Main Points:

1. *(A) Analysis procedure to identify the problem.

2. *(A) Research resources to collect data.

3. *(A) Creativity in determining alternatives.

4. *(A) Assessment of possible outcomes of each alternative.

5. *(A) Assessment of probable outcomes of each alternative.

6. *(A) Individual choice of acceptable solutions.

*The letter (A) before the main point indicates "Apply."

In teaching the case, the instructor would probably record student comments on the chalkboard using the following columns:

Identify Problem	Data	Alternatives	Possible Outcomes	Probable Outcomes	Choice

At times the case under consideration has no obvious format for main points or analysis, but an approach will emerge from the instructor's own study of the case. The following is an example:

Lesson Objective: "...for the students to apply the principle of delegation of authority in management situations."

Main Points:

1. (A) Past management training and experience to separate the facts and the assumptions.

2. (A) Group problem solving techniques to clearly define the problems.

3. (A) Individual creativity to reach the best possible group solution to the problems.

Chalkboard Arrangement:

Facts	Assumptions	Problems	Solutions

Other examples of lesson objectives, main points, and associated chalkboard arrangements are in Appendix 1. These examples are merely illustrations of possible approaches. Two different instructors teaching identical objectives and using the same case might use completely different main points and analysis procedures with equal efficiency and effectiveness.

The instructor is now prepared to develop the lesson objective and the lesson's main points. The objective is often stated at the application level, although some cases may lend themselves better to the comprehension level. An example of an acceptable objective is illustrated on Part I of the lesson plan at the end of the chapter. Note that this instructor wants students to "apply the principle of delegation of authority." The main points will be identical to the format selected for analysis, namely: 1. facts and assumptions, 2. defining the problem, and 3. presenting solutions.

With a specific, well-defined objective and logical main points, we are ready to develop the lesson plan.

The introduction of the case lesson plan development differs only slightly from the other teaching methodologies. The attention and motivation steps are the same, with the major difference occurring in the overview. Here the students are given an opportunity to read the case, if it is short and if they have not read it before coming to class. Students are told how the lesson will proceed and the point of view they should adopt. They may or may not role play. In the sample lesson plan, students assume the role of a colonel—Major Beeman's boss.

The development phase elaborates on each main point in the lesson plan through the use of well-formed, preplanned questions. "What are the facts in this case?" "Who is causing the biggest problem?" "Which of these violations has the most serious consequences?" Instructors who have prepared thoroughly will be able to transition from one main point to another (and from issue-to-issue within main points), to guide the class into critical areas for discussion, and ultimately to lead them to the overall lesson objective.

The conclusion summarizes the case and relates it to the concept or principle to be illustrated. It then proceeds to show how this same concept or principle can be used to deal with other similar situations. The remotivation and closure steps are similar to those in other methodologies.

PRESENTATION

As with other aspects of the teaching case, there is no set procedure for conducting the class, but a number of general guidelines have worked well in past case sessions:

Refraining from lecturing. The case method is inherently a student-centered approach. Keep instructor comments to a minimum and let the students do the talking.

Starting the discussion. Some case leaders begin with the question, "What is the issue here?" and from there go on to, "What are the pertinent facts?" Others begin with the more general question, "What action should be taken?" The approach depends on the intellectual maturity of the students and with the subject matter.

Controlling participation. The case discussion is controlled much like the guided discussion, except that in the case, the instructor may feel more free to enter the discussion. The case instructor often keeps track of the discussion at the chalkboard, so that the entire class has a visual record of where the discussion has been and where it is going. The questioning techniques used in case method are the same as for the guided discussion.

Being non-directive. In case studies there is often no single right answer. It is more important to lead students toward sound application of principles than to persist in an endless search for one right answer. In the body of the lesson, the instructor should, of course, "guide" the discussion. But imposing the instructor's views on the students, passing judgments on contributions, and arguing do little toward encouraging independent thinking or achieving the lesson objective. Attempts to force a conclusion on the group often fail. Save instructor comments for the conclusion.

Case Roles

In the process of presenting a case, the instructor as well as the students have roles they are responsible for. Fulfilling these roles increases the probability of a successful lesson.

Instructor Roles. As case leaders, how should we behave? We can dominate, control, and structure the discussion of a case and emerge from the discussion with our own solution. On the other hand, we can demonstrate a high degree of leadership skill in guiding and involving students in their discussion and solution of the case. In either instance, we serve in the role of recorder, questioner, and occasionally as clarifier or expert.

In our role of recorder, we provide direction and organization to the discussion of a case by writing ideas on a chalkboard as they are submitted by the students. We also record problem areas and items for further analysis and solutions by the discussion group. To avoid confusion or distraction, we might list the major elements of the selected decision/analysis process on the chalkboard. Under each category, we might list specific student contributions. This task requires disciplined listening and undivided attention to every statement made during the discussion period.

One of the most important requirements of the case study method is the instructor's ability to use good questions. Questions are the principal device for clarifying contributions to the discussion and for relating ideas to the problem under discussion. Another questioning technique in the transfer of ideas is to review past experiences as they relate to a new problem. Frequently, to avoid student superficiality, a simple question "Why?" to confront a student's assertion stimulates an orderly analysis of a problem. The instructor also has a responsibility to assure that the discussion is meaningful. We are the experts in teaching the subject and also in helping students express themselves. We should see that every student has an opportunity to participate. It is also our responsibility to establish rapport and maintain student interest in the case under discussion.

The Student's Role. The case method of instruction may require more student preparation than any other teaching method. If students do not prepare for class participation, they do themselves an injustice and deprive other students of possible discussion. As minimum preparation, they must read and study the case thoroughly. If there is time they might also refer to as many related references as possible.

During class discussion of the case, students should think reflectively and strive for cooperation rather than competition. They should share responsibility to contribute briefly and directly to the discussion and to assist in developing group concepts based on specific items of information. Thus self-motivation is a significant element of the case study method, and this motivation obviously enhances the learning process.

Follow-up. What we do after the class session is over is often as important as what preceded the period. If student participation is part of the course grade, we should establish the criteria for grading beforehand, make it known to the students, and take notes while the impressions are still fresh in our mind. Even more important for future use of the case, we should review the lesson plan and note corrections needed in the case, possible changes in questions, and new lines of thought or different methods of analysis brought out by the students.

In this way, the case stays fresh and becomes a more refined tool for use with subsequent classes.

SUMMARY

The case, properly used, initiates students into the ways of independent thought and responsible judgment. It faces them with situations which are not hypothetical but real. It places them in the active role, open to criticism from all sides. It puts the burden of understanding and judgment upon them. And it gives them the stimulating opportunity to make contributions to learning.

In the problem solving environment of the classroom, the students develop skills in communicating their ideas to others. At times, they may add to the ideas contributed by other members of the group, and, at other times, they may take exception to their peers' ideas. Both actions require effective communication techniques, and both involve a type of interaction that leads to consensus and understanding. The case study method increases the student's ability to appreciate other points of view, to explore and discuss differences of opinion, and, eventually, to reach an agreement. It forces students to think analytically, constructively, and creatively, and it gives them the satisfaction of participating in an orderly social relationship with others.

APPENDIX 1

EXAMPLES OF CASE METHOD OBJECTIVES

Example 1.

Objective: "...apply the ISD process to course development."

Main Points:

1. Analyze system requirements.
2. Define education/training requirements.
3. Develop objectives and tests.
4. Plan, develop, and validate instruction.
5. Conduct and evaluate instruction.
6. "...apply the ISD process to course development."

Chalkboard Arrangement:

Step 1	Step 2	Step 3	Step 4	Step 5

Example 2.

Objective: "...apply the Carkhuff counseling approach to given counseling situations."

Main Points:

1. (A) Attending skills
2. (A) Responding skills
3. (A) Initiating skills
4. "...apply the Carkhuff counseling approach to given counseling situations."

Chalkboard Arrangement:

Attending	Responding	Initiating

Examples #3

Objective: "...apply the concept of professional ethics in a leadership situation."

Main Points:

1. (A) Analysis of cast of characters and their relationships with each other.

2. (A) Analysis of ethical considerations of each character.

3. (A) Analysis of the impact of professional ethics in a leadership situation.

Chalkboard Arrangement:

Characters	Ethics	Impact

Example #4

Objective: "...apply the principle of creativity to a survival situation."

Main Points:

1. Develop criteria necessary to construct a priority list of survival items.

2. Generate uses for the list of survival items.

3. Apply the criteria to construct a priority list of survival items.

4. "...apply the principle of creativity to a survival situation."

Chalkboard Arrangement:

Criteria	Uses of Items	Priority of Items

LESSON PLAN

Part I
COVER SHEET

LESSON TITLE: Prosecutorial Discretion
INSTRUCTOR: Captain Dunlap

TEACHING METHOD: Short Case Study
REFERENCES: Manual For Courts-Martial; National College of District Attorneys Booklet; Prosecutorial Discretion, Houston, Texas, 1978.

AIDS/HANDOUTS: Chalkboard

PART IA

LESSON OBJECTIVE(S): The objective(~~s~~) of this lesson (is, are) for each student to comprehend that prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

SAMPLES OF BEHAVIOR:

1. Predict the effect of providing commanders with viable alternatives for resolving disciplinary problems through prosecutorial discretion.

2. Distinguish among prosecutorial discretion factors which provide commanders with viable alternatives for resolving disciplinary problems.

3. Justify the use of prosecutorial discretion in resolving disciplinary problems.

4. Explain how commanders can resolve disciplinary problems through the effective use of prosecutorial discretion.

5. Give original examples which illustrate prosecutorial discretion providing commanders with viable alternatives for resolving disciplinary problems.

PART IB

ORGANIZATIONAL PATTERN: Problem/Solution
STRATEGY: The case study provides the problem. Three problem-solving activities are necessary. In analyzing the case, the students must first develop a list of relevant facts. Once this action is complete, the students will be given a list of viable options available to the commander as possible solutions to the problem.

Each option will be explained in the depth necessary to insure each student comprehends the options. Next the feasibility of each option will be determined based upon relevant facts and the prosecutorial discretion factors involved. The three main points will be introduced in the lesson introduction and will be reinforced at various points in the lesson, including the final summary. Using support material from my summary of the case study, I will go on to establish the generalization that prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

LESSON OUTLINE

- Case Study Activities

1. Outline facts relevant to the situation.

2. Explain options available to the commander.

3. Identify prosecutorial discretion factors most relevant to each option.

- Lesson Objective/Main Points

Objective: Comprehend that prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

Main Points:

1. (C) "Nature of the offense" allows commanders to consider the overall impact of the individual's offense.

2. (C) "Nature of the offender" allows commanders to give careful consideration to the person's past record and current attitude.

3. (C) "Prosecutorial burden" allows commanders to consider the feasibility of prosecuting the offender.

4. (C) Prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

PART II
TEACHING PLAN

INTRODUCTION

ATTENTION: (Rhetorical questions) Have you ever wondered why one person gets prosecuted for a crime while another does not? Or why is one person prosecuted as a felon while another who commits the same offense suffers only a misdemeanor prosecution? Why is one person given a court-martial by a commander while another is given an Article 15 for the same offense?

The prosecutor, be it a military commander or a civilian district attorney, is exercising a concept known as prosecutorial discretion.

Describe prosecutorial discretion.

Outline and explain prosecutorial discretion factors:

1. Nature of the offense
2. Nature of the offender
3. Prosecutorial burden

MOTIVATION: If you become a commander, P.D. gives you options for resolving disciplinary problems.

If you are not the commander, your commander may ask you to recommend a form of disciplinary action for one of your subordinates. An understanding of P.D. will allow you to make recommendations based upon reason instead of emotion.

If you are the victim in the civilian world, the district attorney may ask you if you want to prosecute the case. This is a P.D. factor that both you and he must consider.

OVERVIEW: Insure all students have copies of the case and have read it.

Reveal the analysis procedure to be used (use chalkboard). The students will:

1. Determine what facts are relevant to the situation.

2. Examine options available to the commander.

3. Discuss prosecutorial discretion factors most relevant to each option in seeking a solution to the problem.

Encourage all students to participate actively and to draw upon their wide range of experience.

TRANSITION: Now that you have had a chance to see where we are going in today's case, let's go to the first step in the analysis process and identify the important facts.

DEVELOPMENT

- CASE STUDY ACTIVITIES:

1. Outline facts relevant to the situation.

QUESTIONS	ANTICIPATED RESPONSES
LOQ: What facts are pertinent to the offense?	45 days AWOL Disobeyed CC order Etc.
FUQ: What factors, if any, aggravated the offense?	Mission requirements Conduct toward Airman Jones

FUQ: What mitigating factors are present?	Mother's illness Remorse (apology)
FUQ: What are the relevant facts concerning Major Stun himself?	Doctor, highly qualified Otherwise clean record
FUQ: What are the factors relating to the base?	Increase in case load at clinic Airman Jones' friends know of offense Junior enlisted normally court-martialed
FUQ: What factors relate to the Air Force?	Shortage of doctors

INTERIM SUMMARY: (from chalkboard) Review facts relevant to the situation.

TRANSITION: To this point we have established a list of the relevant facts bearing on this offense. We can now examine options available to us.

2. Explain options available to the commander. Go into depth required based upon perception of student understanding of each.

   a. No punishment
   b. Oral reprimand
   c. Written reprimand
   d. Article 15
   e. Court-martial

3. Identify prosecutorial discretion factors most relevant to each option.

QUESTIONS	ANTICIPATED RESPONSES
LOQ: What are the arguments, if any, for doing nothing in this situation?	Good record Doctor shortage
FUQ: What are the arguments against doing nothing?	Fairness Morale of the troops Serious offense
FUQ: What are the arguments for a reprimand, oral or written?	Some punishment No serious, long-term effect
FUQ: What are counter-arguments?	Too little punishment Hurts morale
FUQ: What are the arguments for an Article 15?	Meaningful punishment without destroying career Court-martial too drastic
FUQ: Arguments against an Article 15?	Will hurt career (personnel office statement) Too light--field grade officer should be held to higher standard

FUQ: What are arguments for a court-martial?	Serious offense Appropriate Effect on mission
FUQ: Arguments against a court-martial?	Would result in disproportionate punishment--recall basically good record Extenuating circumstances

INTERIM SUMMARY: Summarize arguments students have made for and against each of the options available.

TRANSITION: Now that we have examined various possible solutions to the problem presented in the case, let's review what we have done.

CONCLUSION

FINAL SUMMARY:

- MAIN POINTS/OBJECTIVE: (Develop using student/instructor support material)

1. The "nature of the offense" allows commanders to consider the overall impact of the individual's offense.

2. The "nature of the offender" allows commanders to give careful consideration to the person's past record and current attitude.

3. "Prosecutorial burden" allows commanders to consider the feasibility of prosecuting the offender.

4. Prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

   a. Explain how they employed the concept of prosecutorial discretion.

   b. Explain how utilization of P.D. factors opens up previously unconsidered options for the commander.

   c. Restate the lesson objective.

REMOTIVATION: Reemphasize the importance of looking at all the factors. Illustrate with stories from personal experience. Emphasize the importance of a systematic approach and tell students that P.D. will simplify complex and often emotional decisions for them.

CLOSURE: Leave students with the thought that when they hear of a case which is being handled very differently from a case involving the same basic offense, this is not necessarily bad, but rather might be a proper exercise of P.D. and, in fact, an application of real justice.

PART III
TEST ITEMS

LESSON OBJECTIVE: Comprehend that prosecutorial discretion provides commanders with viable alternatives for resolving disciplinary problems.

1. SAMPLE OF BEHAVIOR: Predict the effect of providing commanders with viable alternatives for resolving disciplinary problems through prosecutorial discretion.

QUESTION: (Multiple Choice)

The proper application of prosecutorial discretion by a commander will MOST LIKELY cause the number of prosecutions to:

a. increase
b. decrease
c. remain the same

KEY: c

2. SAMPLE OF BEHAVIOR: Distinguish among prosecutorial discretion factors which provide commanders with viable alternatives for resolving disciplinary problems.

QUESTION: (Short Answer)

Airman Jones is a 19-year-old computer programmer. He is caught smoking marijuana while on duty in the computer center. The base has a serious drug problem. Airman Jones has two dependents and this is his first offense.

You have learned three groups of prosecutorial discretion factors. Using the scenario above, classify pertinent prosecutorial discretion factors into the categories below. Then, in 100 words or less, tell why these two categories should be considered by commanders in resolving disciplinary problems.

A. Nature of the offense B. Nature of the offender

KEY: Students should identify and distinguish the age/rank and prior clean record as factors relating to the "nature of the offender," and the "on duty" status of the crime and the base wide problem as factors relating to the "nature of the offense." "Nature of the offense" allows commanders to consider the overall impact of the individual's offense. The "nature of the offender" allows commanders to give careful consideration to the person's past record and current attitude.

3. SAMPLE OF BEHAVIOR: Justify the use of prosecutorial discretion in resolving disciplinary problems.

QUESTION: (Essay)

In 400 words or less, justify the use of prosecutorial discretion in resolving disciplinary problems. Partial credit will be given. One point will be deducted for each spelling error. The question is worth a total of 40 points.

KEY: Students should identify the three key areas of P.D. (nature of the offense, nature of the offender, and prosecutorial burden) and explain how a review of them and their subpoints will bring to light options not readily apparent in the disposition of cases.

CASE STUDY

Capt Dunlap

"What's Up Doc?"

Major Stun is a highly qualified psychiatrist assigned to an Air Force hospital. On 1 October he receives word that his mother is gravely ill with cancer. He requests (and is granted) a 30 day emergency leave. At the end of this period Maj Stun requests an additional 15 days leave as his mother is not expected to live. However his commander denies the request because the base has a serious backlog of cases and mission effectiveness has started to suffer. The commander tells Maj Stun that he is urgently needed at the base and orders him to return immediately. Maj Stun grudgingly agrees and hangs up.

After stewing about the situation for several hours, Maj Stun calls the orderly room back and speaks with Airman Jones, who is the only person present. Stun tells Jones that he is not coming back until the situation with his mother is resolved. Jones tries to tell Stun that the commander will be furious, but Stun cuts him off: "If he needs a shrink so badly, he can just find himself another." Jones relates this incident to his buddies in the barracks and predicts that nothing will be done. Jones himself recently received an Article 15 for being frequently late for work.

Maj Stun's mother recovers. Shortly before Christmas he returns to the base and apologizes to the commander. Moreover he offers to work the entire holiday period so that the other physicians can have the time off. He explains to the commander that he was distraught over his mother's illness and promises not to repeat his misconduct.

The commander asks you for a recommendation as to what disciplinary action, if any, he should take. He notes that, except for this incident, Maj Stun has an excellent record and that the Air Force is critically short of doctors. The staff judge advocate advises that junior enlisted personnel ordinarily receive a court-martial for this offense. The personnel officer says that even an Article 15 would be disastrous for this officer's career. The options are 1) do nothing, 2) oral reprimand, 3) written reprimand and establishment of an Unfavorable Information File, 4) Article 15 (maximum: $2,000 forfeiture), and 5) court-martial (maximum: confinement at hard labor 1 yr, dismissal).

CASE STUDY

CAPT DUNLAP

PROSECUTORIAL DISCRETION

FACTORS

I. NATURE OF THE OFFENSE

- A. impact on victim, if any
- B. impact on mission
- C. impact on society/Air Force

II. NATURE OF THE OFFENDER

- A. prior disciplinary record
- B. military record
- C. exceptional achievements/awards
- D. age/experience
- E. remorse/restitution
- F. "graduated response"

III. PROSECUTORIAL BURDEN

- A. cost
- B. availability of proof
- C. mission requirements

LESSON PLAN

Part I
COVER SHEET

LESSON TITLE: Too Busy to Manage

TEACHING METHOD: Case Study
REFERENCES: Managing, A Contemporary Introduction, Massie and Douglas, Prentice-Hall, Inc., N.J., 1973
AIDS/HANDOUTS: Title Chart, chalkboard, copies of case scenario

PART IA

LESSON OBJECTIVE: The objective(~~s~~) of this lesson (is, a~~r~~e) for each student to apply the concept of delegation of authority in management situations.

SAMPLES OF BEHAVIOR:

1. Given a problem situation involving mismanagement due to inadequate or improper "delegation of authority" and several alternative management concepts, correctly identify that problem as one of mismanaging "delegation of authority."

2. Given a problem situation involving inadequate or improper "delegation of authority," propose a reasonable solution which is consistent with the facts and which is generally consistent with the concept of proper "delegation of authority."

3. Given a real problem at Hq USAF level (or at an experience level above that of the students), solve the problem through proper application of the concept "delegation of authority."

4. Given a common management situation containing new elements as compared to the situation in which the concept was learned, demonstrate proper application of the concept "delegation of authority" in solving the problem.

PART IB

ORGANIZATIONAL PATTERN: Problem/Solution

STRATEGY: The problem-solving sequence of "facts and assumptions, problem, and solutions" will be used to analyze the case "Too Busy to Manage." This format, arrived at during development of the Teaching Note, will be the sequence used to develop the body of the lesson. Its main purpose is to provide structure to the lesson and a possible sequence for analysis of future situations encountered in the real world.

Part II
TEACHING PLAN

INTRODUCTION
(5 min)

ATTENTION: Brief summary of management concepts covered during this block of instruction.

MOTIVATION: Cannot be applied universally without regard to the personnel, technology, or environment in which they are applied.

However, the concepts can provide you with general guidelines for managing an organization. But it is one thing to have some understanding of the concepts and another to be able to apply them in realistic situations.

Today we will practice applying one or more of these concepts in a realistic situation. You will have an opportunity to practice your management skills in the safety of the classroom environment as we examine the case "Too Busy to Manage."

OVERVIEW: Ensure that all students have copies of today's case and have had time to read it. (Tell them they may write or mark on the handout.)

Reveal the process that will be used to solve today's case. (Refer to chalkboard.)

Encourage all students to participate actively and contribute to the best possible solution of the problem based upon their wide range of past experience.

Assign role: You are the Director of Logistics, a Colonel with 20 years in Supply and Maintenance, who is Major Beeman's immediate supervisor. You just became aware of what's happening in Supply. What action will you take to correct the situation and retain Major Beeman as Chief of Supply (as stated in ROTC casebook)?

TRANSITION: Now that we see where we're going in today's case, let's separate the facts from the assumptions as our first step in the process.

DEVELOPMENT
(34 min)

INSTRUCTOR ACTIVITY

1. Ask questions to get class to separate the facts from the assumptions using past management training and experience.

LOQs and FUQs

a. What are some of the facts in this case?

b. What assumptions can we make about Major Beeman's personality?

c. What assumptions can be made about the immediate future regarding the 927th Supply Squadron?

d. Why is it important to know Major Beeman's career background?

e. What facts do we know about the other squadron personnel?

f. Is it a fact or an assumption that Major Beeman's management techniques are ineffective? Why?

Interim Summary: Instructor will summarize those facts and assumptions selected by the class and recorded on the chalkboard.

TRANSITION: Obviously we have been able to differentiate between facts and assumptions in the case; at this time, let's go on to our second step and attempt to clearly define the problem(s) in this case.

2. Ask questions to get class to define problems in the case by using group problem solving techniques.

a. Why is it important for you, as Director of Logistics, to define clearly the specific problem before taking any action?

b. What are some of the underlying problems involved in this particular situation?

c. Who is causing the biggest problem in this case? How?

d. Which problems are immediate and which are long-range?

e. Why is it important to work on the most pressing, immediate problems first?

Interim Summary: Instructor will summarize group's discussion of immediate and long-range problems then read final problem definition as recorded on chalkboard.

TRANSITION: Now that we have determined the basic problem in the case, let's decide on the best course of action to take in solving the problem(s). (We can redefine the problem if necessary.)

3. Ask questions to get class to reach the best possible group solution to the problems by using individual creativity.

a. How can your past experiences aid you in solving this problem?

b. How can the 927th Supply Squadron be run more smoothly without replacing the Squadron Commander?

c. How might advanced management training effect Major Beeman's management techniques?

d. What concepts of management does one see being violated in this case?

e. Which of these violations has the most serious consequences?

f. Why is it important to delegate authority within a unit?

g. How might Major Beeman's self-concept play an important part in his management techniques?

h. Why is it important for intermediate level managers to feel needed?

(Instructor will read final solution(s) recorded on chalkboard.)

TRANSITION: Now that we have reached a viable solution in the "Too Busy to Manage" case, let's go back and see how we pooled our past experience and decided that the principle of delegation of authority was being violated by Major Beeman.

CONCLUSION
(8 min)

FINAL SUMMARY:

4. Apply the concept of delegation of authority in management situations.

Thank students for their participation in the case and put them back into their role as AIS students.

Summarize the case with emphasis on how the concept of delegation of authority was violated.

Show how the student inputs would apply to the concept of "delegation of authority."

Use some new examples of delegation of authority from ROTC management text and personal experience.

REMOTIVATION: Remotivate the students by showing them several applications of the concept of delegation of authority as an Air Force leader, classroom instructor, and as a parent.

CLOSURE: Establish closure with quotes on Delegation of Authority from Managing, A Contemporary Introduction, p. 107 and p. 121.

PART III

TEST ITEMS

The following scenario will pertain to questions 1 and 2:

Scenario: Lt Blitzfield was assigned to the 5th FIS located at Everywhere AFB, Arizona, six months ago. This was his first base assignment after completing tech school. He had graduated with honors from a school which was oriented towards management skills. He was assigned to the 5th FIS Avionics Division. Lt Blitzfield performed well in his job and was a real go-getter. After only three months he proposed a plan to Capt Comstock, his supervisor. Since the 5th FIS had recently gained access to a computer located on the base, the Lieutenant proposed a way to use the computer to increase efficiency within his section. Capt Comstock gave the OK to the plan and it was initiated two weeks later.

At first things went great. The avionics section he was in charge of saw an improvement in aircraft turn around statistics, which showed the plan had merit. But then things began to go downhill. Essentially the plan had eliminated most of the duties of MSgt Loney. MSgt Loney was NCOIC of Avionics and was not even aware of the computer plan being formulated before it was put into action. He had six months remaining before retirement and until recently had worked hard at his job. After the computer started doing most of his work for him, he developed a poor attitude saying all he wanted to do was get out. This attitude affected the other enlisted workers. They developed similar attitudes doing only the minimum amount of work.

LESSON OBJECTIVE: Apply the principle of Delegation of Authority in management situations.

1. SAMPLE OF BEHAVIOR: Given a problem situation involving mismanagement due to inadequate or improper "delegation of authority" and several alternative management principles, correctly identify that problem as one of mismanaging "delegation of authority."

QUESTION: (Multiple Choice)

Based on your understanding of management principles, which of the following principles most clearly appears to have been violated in the problem situation described above?

a. Delegation of Authority
b. Span of Control
c. Unity of Command
d. Another principle not listed above

KEY: a

2. SAMPLE OF BEHAVIOR: Given a problem situation involving inadequate or improper "delegation of authority," propose a reasonable solution which is consistent with the facts and which is generally consistent with the concept of proper "delegation of authority."

QUESTION: (Essay)

In 300 words or less, propose a reasonable solution to the problem faced by Capt Comstock and Lt Blitzfield which is consistent with the facts and the proper application of management principles. (Partial credit may be awarded. Two points will be deducted for each spelling error. The question is worth 20 points.)

KEY: Delegation of authority means that a superior has a clear understanding with his subordinates; that the subordinate has the power to make decisions and to act within explicit limits without checking with the superior. Proper application of the principle of delegation of authority would enable the superior (Lt Blitzfield) to share his responsibility with a trusted subordinate (Msgt Loney). Line authority is the backbone of hierarchy and must be respected. Lt Blitzfield must delegate authority to MSgt Loney commensurate with his position responsibilities as NCOIC of Avionics. With proper delegation of authority, MSgt Loney would assume definite responsibilities for the project and be accountable to Lt Blitzfield for his decisions and actions. (These ideas must be developed and expanded upon for the 20 points.)

ACADEMIC INSTRUCTOR SCHOOL

Maxwell Air Force Base, Alabama

AI-460d
1-0

SAMPLE CASE 3

Too Busy to Manage

Major Beeman is 33 years old. He has been in the Air Force for the past twelve years. He is married and has three daughters.

The major was assigned to the 927th Supply Squadron, Nowhere AFB, in August of last year. His specific duty title was Chief of Supply. As the Chief of Supply he was responsible for the complete function of supply at his base. He had a fully manned organization with seven officers and 68 enlisted men. There were no personnel problems in the squadron. All the men were trained or in training to their highest authorized level. The major had spent his entire career in the supply field, but this was his first assignment as Chief of Supply.

Upon arrival, Major Beeman quickly made it known that he was the boss. He said that he was accustomed to working very hard and that was the way he expected every man in his organization to work. No one thought too much about the major's getting to work ahead of everyone, or that he often worked beyond the end of a normal duty day. Often, however, he would work through his lunch hour as well. Sometimes the lights were still on in the major's office late at night. It was not unusual to find him working on weekends. At first everyone thought he was simply trying to learn his new job, but after a few months it became apparent that he worked so much because he did not trust anyone else. He felt he could do the job faster and better than his subordinates... that is exactly what he was doing.

His staff meetings were generally conducted along the lines of an inquisition. He would ask questions from his officers that required more detail to answer than they were able to give on the spot. Often, he would ask questions then answer his own question before anyone had a chance to respond. He seemed perturbed that he knew more about the detailed functioning of the organization than his officers did.

Problems began to arise. Some of the officers felt that if the major wanted to run the whole show by himself, then they were not needed. They began taking longer lunch hours, and leaving early to play golf.

Most of the enlisted men thought the major was some kind of genius because of his detailed, technical knowledge. Soon the ranking non-commissioned officers (NCOs) also felt they were not needed on the job either. The organization began to fall apart.

OPR: EDL Supersedes AI-465b (2-9)

ACADEMIC INSTRUCTOR SCHOOL
Maxwell Air Force Base, Alabama

AI-460e
1-0

TEACHING NOTE

"TOO BUSY TO MANAGE"

1. OBJECTIVE: This case illustrates materials taught in Part 3, "Management Fundamentals: The Processes for Managing" from *Managing: A Contemporary Introduction* by Massie and Douglas. It seems to deal with three major issues: failure to delegate authority, failure to develop subordinates, and lack of effective leadership.

2. STUDENT PREREQUISITES: Students should already have been exposed to the principles of management.

3. ANALYSIS:

a. Case facts:

(1) Major Beeman is 33 years old

(2) Twelve years of Air Force experience

(3) Married with three daughters

(4) Assigned to 927th Supply Squadron as Chief of Supply last August

(5) Responsible for the complete Base Supply function

(6) Seven officers and 68 enlisted personnel assigned

(7) No personnel problems (no vacancies and all are appropriately trained)

(8) Beeman's first assignment as Chief of Supply

(9) He has high standards for himself and others

(10) He works beyond normal duty hours

(11) Subordinates feel useless and lack of trust

(12) He's intimately familiar with all aspects of the supply function--often more so than the responsible workers

(13) He conducts his staff meetings very autocratically

(14) Subordinates are performing less

(15) Some see him as a genius

(16) The organization has [illegible] to fall apart.

OPR: EDL Supersedes AI-465c (6-8)

b. Case characters

(1) Major Beeman

(2) Officer Corps

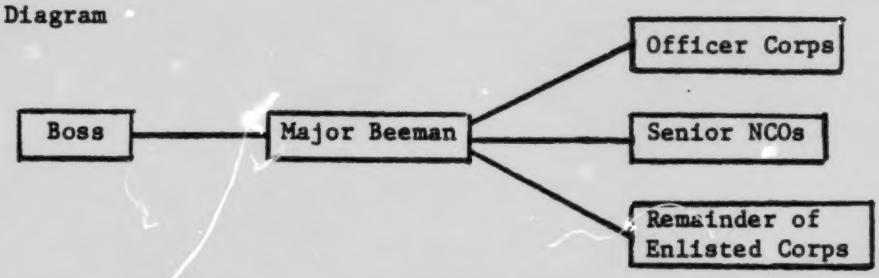
(3) Senior NCOs

(4) Remainder of Enlisted Corps

(5) Although not mentioned in the case, Beeman's boss who is responsible for getting the organization back on track.

c. Relationship of characters to Beeman

(1) Diagram



(2) Boss: Faced with taking some action to get the organization back on its feet. Essentially, the only person working is Beeman. How long can he continue to do the work of 75 other persons? Because of Beeman's approach, the morale is low and is not likely to improve; job performance is not likely to increase.

(3) Beeman:

(a) Has an enviable knowledge of supply; some subordinates are awed by his knowledge. Since they are all well trained (trained to the highest required level of proficiency) and Beeman still knows more than they do, their perceptions seem understandable. Further, his asking the officers detailed questions and then answering them also indicates an extensive knowledge of supply.

(b) For the past 12 years, he has been a worker and not responsible for the overall function. This fact may have something to do with his excellent job knowledge but poor management skills.

(c) His philosophy seems to be that of "If I'm responsible I want to be sure that it's done right. If I do it, then I know it's done properly." When others perform the task he's no longer "in the know" while he still is responsible.

(4) Officers and Senior NCOs are not being properly used, have no authority, and see the staff meetings as sources of embarrassment and

humiliation. Their source of defense is passive resistance. "If he doesn't like how we do it, let him do it all himself."

d. Symptoms vs root causes:

(1) Symptoms--lack of trust, low morale, nonperformance by subordinates, total dominance by Beeman.

(2) Root cause--Beeman's "I" centered management philosophy and resultant nondelegation of authority to the officers and NCOs.

e. Solutions:

(1) Management training for Beeman

(2) Reassignment

(3) Counsel him

(4) Have others participate (brief, etc.) in staff meetings--assign individual projects to others

(5) Establish communication net between Beeman and the subordinates

(6) Combination of solutions

4. RELATED AREAS:

a. Air Force policy on reassignments to address the solution of getting rid of Beeman.

b. Availability of management schools to accommodate possible needed formal training for Beeman.

5. LESSON OBJECTIVE: Relate this case to delegation of authority in general. Address such areas as: What happens when the needs of others are not met? What happens when autocratic leadership style is used? What are some other areas, perhaps non-job related, where delegation of authority can be effective?

6. QUESTIONS TO BE DEVELOPED IN CLASS:

a. What are some of the facts in this case?

b. What assumptions can we make about Major Beeman's personality?

c. What assumptions can be made about the immediate future regarding the 927th Supply Squadron?

d. What does Major Beeman's career background offer us?

e. What facts do we know about the other squadron personnel?

f. What are some of the underlying problems involved in this particular situation?

g. Who is causing the biggest problem in this case? How?

h. Which problems are immediate and which are long-range?

i. Why is it important to work on the most pressing, immediate problems first?

j. Why is it important for you, as Director of Logistics, to define clearly the specific problem before taking any action?

k. How can your past experiences aid you in solving this problem?

l. How can the 927th Supply Squadron be run more smoothly without replacing the Squadron Commander?

m. How might advanced management training affect Major Beeman's management techniques?

n. What principles of management can we see violated in this case?

o. Which of these violations has the most serious consequences?

p. Why is it important to delegate authority within a unit?

q. How might Major Beeman's self-concept play an important part in his management techniques?

r. Why is it important for intermediate level managers to feel needed?

Chapter 16

THE TEACHING INTERVIEW METHOD

As part of our daily lives, conversation occurs when two or more people exchange information or viewpoints. An interview is a special type of controlled conversation aimed at specific objectives. Interviews vary broadly in content according to their purpose or the situation in which they are conducted. For example, we use personnel interviews when we evaluate performance and when we reassign, retain, or separate. Managers use interviews for giving orders and handling complaints or reprimands. Interviews are also used in sales, counseling, and information-gathering, including polls and surveys, and for such specialized purposes as medical diagnosis, criminal investigation, and legal inquiry. The teaching interview is another type of interview, but its main use is to promote learning.

BACKGROUND

Much like the guided discussion, the interview as an educational technique started when the first student asked the first question and the first teacher replied. Tradition credits the Greek philosopher Socrates with a pupil/teacher dialogue which replaced the one-sided lecturing of the Sophists, a class of professional teachers in ancient Greece. Still in use today, Socratic dialogue relies on the assumption that each person has a storehouse of knowledge and understanding which can be discovered through questioning techniques. Students who participate in this exchange of ideas and opinions learn by relating what they know to what they don't know. The dialogue is the basis of most discussion methods of learning.

The teaching interview is a dialogue in a classroom situation which pairs a skilled instructor with a recognized expert. The expert has specialized knowledge or a broad understanding of a subject, and the instructor attempts to draw out that knowledge and understanding by means of questions. The students learn by observing the interview and asking questions.

USES OF THE TEACHING INTERVIEW

The teaching interview can be used as a primary method for achieving planned learning objectives. The instructor's job is to elicit the responses from the guest expert which allow the students to reach these desired learning outcomes. Many schools already have a guest speaker program. Because guests may depart from the planned topic or lesson outline, they often do not help achieve planned lesson objectives. Reasonable control over the actions of a guest speaker is a primary advantage of the teaching interview.

The teaching interview may also be used to supplement the instructor's knowledge of a specific subject area. In the Air Force, we are often asked to teach subjects in which we are not completely expert. When the subject matter is very broad, an outsider may help cover our "knowledge gap." For example, management courses could easily profit from the interview of an expert who has had experience in conference leadership. In educational fields, experts who have worked with motivating adults could contribute significantly to an understanding of the learning process. PME schools have benefited frequently by bringing to the classroom management experts and interviewing them for the students.

Another use of the teaching interview is curriculum enrichment. The appearance of an expert or authority enhances the credibility of a classroom that is difficult to duplicate by the average teacher. The teaching interview lesson may also be used to add variety to the curriculum. For example, if the instructor usually lectures, a teaching interview can be an exciting change of pace to the regular routine.

The teaching interview can also be a motivational device. It can be used to introduce a block of instruction and gain the students' interest. For example, a physician might introduce a series of lessons on first aid, or a former POW could stimulate interest in the Code of Conduct.

The teaching interview can also be used as a problem-solving activity. The instructor can interview an expert in a particular area, presenting a problem to the expert for solution. During the course of the interview, the expert can present the solution to the problem.

INITIAL PLANNING FACTORS

The instructor must examine the curriculum closely to determine the need for interview lessons. The interview lesson is best suited for exploring attitudes, experiences, and opinions, rather than conveying facts. Generally speaking, teaching interview lessons should be planned at the comprehension level within the cognitive domain or at the lower levels of the affective domain. The instructor should also make a value judgment about the expert's ability to contribute to the overall learning experience.

Once we see a need in the curriculum for the teaching interview, the next step is to plan the objective of the interview. Remember that an interview can examine an expert's reasoning process and the rationale used for arriving at conclusions. The interview probes the "whys" and "hows" of a thinking mind. The interview lesson discusses "the importance of...," and "the reasons for...," and "the value of..." particular events or actions, rather than the events or actions themselves. These valuable additions to the learning process influence the focus of the lesson objective. The teaching interview lends itself to teaching both concepts and principles.

After stating the objective of the lesson, we must select the expert to be interviewed. Just as the first step in any sort of research is to explore our own resources, so the first step in selecting an expert is to examine our own faculty or colleagues. The best available resource may be in the next office. Your base, the local community, or a nearby college often provide experts for interview lessons.

We should select a recognized expert if one is available. Students respond to persons they acknowledge as experts and generally accept their remarks readily. Since students frequently accept the acknowledged expert's testimony at face value, you can save time by not having to develop support material to substantiate the expert's ideas.

When selecting a prospective expert, find out all relevant information about the person. Make sure the expert can set forth views with candor and frankness and explain clearly the basis for opinions. If you discover that the person generally thought to be an expert really is not particularly expert, or that the expert's personality or style of presentation might be a serious barrier to learning, find someone else.

Spend time researching the subject that the interview lesson will cover. If the expert has published works or made public statements, examine them to gain insight into the views expressed. If you have a thorough grasp of the expert's opinions and viewpoints, you can pick and choose those ideas of the expert which will be of the greatest value to the students.

You are now ready to narrow your research to the subject of the interview itself: What specific topics will be covered? What sorts of questions will prompt the best answers? How should you react to the responses of the expert? Obviously, you do not need to know the subject matter of the interview as well as the expert. Perhaps a method other than the teaching interview should be used if you have as much expertise as your guest expert.

The last step in the preliminary planning of the teaching interview is the preparation of a logically organized outline of the lesson. Consider how the expert's knowledge can best be used to satisfy the overall lesson objective. As your prepare this outline, you will probably discover that some limitation of the subject, as well as the lesson objective, is necessary. When you consider the time allotted for the lesson, the depth of detail, and the degree of understanding desired, you will probably find that the scope of the interview should be limited.

The outline will also suggest question areas. Place yourself in the position of the students and decide what they need to know in order to increase their understanding of the expert's attitude or experience. You need not write out specific questions for the interview at this point; instead, establish in your own mind the general areas of questions to be covered.

COORDINATION

Three major coordinating steps precede the actual teaching interview lesson. Two of these steps involve meetings between instructor and expert, while the other deals with the students themselves.

Preview the Subject with the Expert

The first coordinating step involves interaction between the instructor and the expert. The aim of the initial contact should be the previewing of the subject of the interview, where the essential facts and the specific topics or subject areas to be covered are discussed. However, you may not want to give the expert the actual questions you will ask since you want the interview to be spontaneous. A common outline of the lesson may be prepared with the expert which can serve as a tentative guide for the interview itself. Decide upon any visual aids that you will prepare or provide, whether they are for your own requirements or for the guest to use.

One of the most important considerations in the preview is to help the expert gain a better appreciation of which areas of subject content are to be covered. You should add or delete items that either the expert does not feel qualified to discuss or may wish to avoid in public discussion, eliminating any potentially embarrassing situations which will inhibit a feeling of mutual trust. Remember that an interview lesson is not an interrogation in which the expert is to be badgered into an admission of guilt or error, nor is the interview lesson an opportunity to make the expert appear foolish, ignorant, or upset.

Mutual considerations during coordination will lead to good rapport which is essential to the successful outcome of the interview lesson. If you cannot arrange a face-to-face meeting, the topics for the interview can be arranged by correspondence or by telephone. Building rapport and establishing a good working relationship will have to wait until shortly before the lesson begins.

Announce the Visitor's Appearance to the Class

The second coordinating step involves the students themselves. The interview should not be a surprise. Motivate your students by announcing that a guest will be visiting the class. You could distribute a short biographical sketch of the expert to the students or a brief outline of the lesson to be presented. This material will help arouse student interest and curiosity and may be highly motivational as well. Students may become more involved if you ask them for questions to be used during the interview. When the students know who is coming, what the expert's qualifications are, and what the subject is, the interview has a better chance for success.

Meet with the Expert

The final coordinating step is a short meeting between expert and instructor shortly before the actual interview presentation. This final meeting gives the expert a chance to become physically adjusted to the interview situation and to see the classroom and its equipment. This meeting also helps develop informality and cordiality which are particularly important, especially if the expert is meeting the instructor in person for the first time. The instructor should set the expert at ease and establish the relaxed and permissive atmosphere of the interview lesson. In addition, last minute changes in the interview outline can be made.

THE INTERVIEW LESSON

The interview lesson (see sample lesson plan for a teaching interview at the end of this chapter) is not a series of short speeches, nor is it solely a question and answer period. We only need to recall the informality and spontaneity of the popular TV talk shows to understand the atmosphere sought in a teaching interview.

Arrangement of the classroom is as important as in other methods. You and the expert should have enough desk or table space. Students should be able to see and hear both of you without effort. You may choose to be seated to start the lesson or you may remain standing depending on which is more comfortable and appropriate. Normally, you should sit after the questioning begins. If possible, arrange a "warm-up" session in private with the expert just before the interview lesson. If this is not possible, begin the interview with easily answered questions which are geared toward opening up the subject and the person, such as "When did you first become interested in ecology?" or "What led to your interest in military history?" A preliminary conversation is a smooth way to ease the expert into the main thrust of the lesson, but avoid mere social pleasantries.

Introducing the Interview Lesson

Like any other well organized lesson, the introduction of an interview lesson focuses attention on the subject, prepares students to recognize the value of listening, and provides them with a good idea of how the interview will proceed. Introduce the guest yourself so you can stress the qualifications that are pertinent, but keep the introduction simple and take care not to embarrass the guest by overstatement. Make sure you have accurate details. The introduction is the time to announce that you will have a question and answer period at some point during or following the lesson. It is also critical that you present a thorough overview. Do not forget that you are overviewing for both the students and the expert. The overview gives the students a "road map" for the lesson and serves to remind your expert of exactly what is to be addressed.

Normally, students are aware that you have invited a guest to class, and they will be anxious to meet and hear from the expert. You should therefore try to involve the expert in the lesson as early as possible. Be brief in your attention and motivation steps, while not slighting their importance and effect. Introduce the class to the expert if you feel it will enhance the setting. This is an optional procedure, but it often helps in channeling the expert's comments toward student needs. The expert's involvement in the lesson should start as an integral part of the introduction.

Conducting the Interview

The development section of the interview lesson centers on the conversation between the instructor and the expert. The instructor's task is to serve as a stimulus to conversation by asking questions which bring out ideas from the expert in support of the lesson objective. As in the guided discussion, you should plan the lesson so that it will develop along certain lines to satisfy the specific learning objective. For this reason, carefully plan the lead-off question for each main point. When you ask the lead-off questions, ask them as planned. This will ensure that you are headed in the right direction.

Even though your lesson is somewhat structured, you must be careful not to become so directive that conversation is stifled. However, the interview is controlled at all times, even to the extent of tactfully interrupting the expert if necessary. By remaining natural, friendly, permissive, and conversational, you can show genuine interest in both the guest and the subject. Listen to what is being said, and be prepared to ask for further clarification, examples, details, and other support material if required, or to pursue new lines of discussion when necessary. Notes taken during the lesson will be helpful when the time comes to summarize.

Your job as instructor, then, is to bridge the gap between the expert and the students. You interpret what the expert says and provide clarification, when needed, for the students. However, avoid using such phrases as "What you're saying is..." or "Let me clear up what you've just said..." You can ask the expert to clarify points without implying poor communication. You are the best judge of students' needs and also of how well the information given in the interview is satisfying those needs.

Divide your attention, therefore, between looking at the expert and monitoring the students for any cues that would prompt you to seek further clarification from the expert. Careful positioning of the chairs will eliminate any awkwardness in directing eye contact to both the expert and the students.

Your questions are the vehicle for achieving the learning objective of the lesson and satisfying students' needs. The successful instructor organizes questions in a definite sequence relating to the subject's central theme and the lesson objective. Questioning sequences may follow any acceptable organizational pattern (chronological, spatial, topical, and so forth) so long as that pattern is appropriate to the lesson.

Each question should be clear and definite for both the expert and the students. The expert should not have to guess about what the question means, what it implies, or what kind of answer should be given. If the expert seems to be having difficulty with a question, you can restate or rephrase it. Questions which are lengthy, involved, and ambiguous hardly ever produce the best possible response. Questions which are simple, precise, and direct are better for communicating with the expert. Questions which contain unfamiliar or technical vocabulary may be misunderstood by the students or, for that matter, by the expert, and should be avoided. In addition to your planned questions, don't hesitate to use spontaneous questions to get the lesson back on track and to explore new ideas and points. You should have an interim summary before going on to another main point, but you may also wish to use interim summaries to curtail and redirect discussion if the expert gets off track.

Remember to ask questions that direct attention to ideas, elicit comments, and seek explanations which clarify ideas in depth. Some questions perform these tasks better than others. Questions which are thought provoking and require the expert to explain the responses are better for promoting discussion. With an outgoing, talkative expert, you may not have a problem keeping the conversation moving. However, with a quiet, reserved expert, you must ensure that the questions prompt more elaborate responses than simple agreement or disagreement. Questions phrased using "how" or "why" tend to promote more thought and discussion. They will more readily seek out the expert's special knowledge or opinions on the subject. Additional examples of questions which will open up conversation include: "What are your ideas concerning...?", "What is your opinion of...?", "Why do you feel...?", and "How do you view...?"

The instructor must also continually remember that the purpose of the interview is to aid student learning. Therefore, assess the expert's responses on the basis of student understanding and follow up as necessary when the replies are vague, confusing, or incomplete. Carefully plan your follow-up questions, but be prepared to by-pass some of them when the guest has already covered the point involved. If appropriate, ask them verbatim from the lesson plan. However, you must be ready to modify a follow-up question based on the expert's comments which preceded it. Be sure to plan a sufficient number of questions to keep the interview lively. Follow-up questions such as "What are some other examples?", "Under what circumstances would that apply?", or "What is the basis for your opinion?" are useful for clarification.

The instructor may also guide the conversation by repeating phrases which the expert has already used. This technique invariably causes the expert to expand ideas further. Nodding to answers is reassuring and encourages the expert to continue. Certain neutral questions may also be used to obtain a fuller, clearer response. Examples of neutral questions include: "What do you have in mind?", "Why do you feel that way?", and "Why do you think so?"

You should allow adequate time for the expert to reflect upon questions, to decide upon answers, and to word replies. The short gaps in the conversation which these pauses will create are not harmful either to the expert or the students. Actually, they will give the expert a chance to gather together thoughts and give a more complete response than if a follow-up questions is asked too quickly. In addition, the students will have a chance to finish notes and do reflective thinking.

Ending the Interview

The instructor's role in concluding the teaching interview is important. Schedule a question and answer session before the final summary, because you will want that summary to include any pertinent comments made in response to the students' questions. Have a brief interim summary following the last main point and then begin the question and answer period. You may choose to stand up or remain seated for the conclusion, depending on your personal teaching technique. Summarize the ideas presented by the expert and show how they support your conclusion and the lesson objective(s). Remotivate the students to retain and build upon the insights gained during the lesson. This remotivation can occur as a separate step or as part of the summary. Finally, close the lesson by thanking the expert. Do not thank your guest until you are ready to dismiss the class; once you do, the lesson is over as far as both the students and the expert are concerned.

Sample Lesson Plan for a Teaching Interview

The sample lesson plan at the end of this chapter focuses on one key principle (the lesson objective) and two supporting principles (main points). Note the wording of the objective, the fact that the samples of behavior provide evidence of comprehending the overall objective, and that the main points add up to the conclusion stated in the objective. Pay particular attention to the phrasing of the questions and the way that the summary in the conclusion is developed. Notice too, the similarities between this plan and that for a guided discussion (Chapter 14).

SUMMARY

The teaching interview is essentially a method of instruction through which expert resource persons can be used efficiently in the classroom. This method gives the instructor an opportunity to be more flexible and vary presentation modes of teaching, at the same time satisfying planned learning objectives. The degree of success in the use of the teaching interview depends on a good lesson plan and questions which will guide the expert's responses. If you understand the strengths of this method and when it may be used well, you will improve your use of guest speakers. The teaching interview requires little preparation on the part of the guest compared to preparing for a lecture. As such, you most likely will find many individuals enthusiastic in their willingness to help you present a dynamic teaching interview lesson.

LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: Laws of Warfare
INSTRUCTOR: Col K. E. Nelson

TEACHING METHOD: Teaching Interview
REFERENCES: AFP 110-31
AIDS/HANDOUTS: Overview Chart

PART IA

LESSON OBJECTIVE(~~s~~): The objective(~~s~~) of this lesson (is, xxx) for each student to comprehend that adherence to laws of warfare prevents conflicts from escalating to uncontrollable death and destruction.

SAMPLES OF BEHAVIOR:

1. Justify why it is important to follow the laws of warfare.

2. Predict the effect of the U.S. not adhering to the laws of warfare.

3. Estimate the consequences of the enemy not adhering to the laws of warfare.

4. Given a scenario, explain how adherence to laws of warfare could prevent the conflict from escalating to uncontrollable death and destruction.

PART IB

ORGANIZATIONAL PATTERN: Topical

STRATEGY: The lesson objective is a generalization focusing on laws of warfare. Time limitations prevent coverage of all of the laws and how adherence to each prevents conflicts from escalating to uncontrollable death and destruction. Consequently, a sampling technique will be used. First the students will hear the guest discuss requirements governing the status of parties and how these requirements protect human life during periods of conflict. The focus will then shift from people to objects. Rules of aerial bombardment will be developed so students can see why target selection is such a concern in warfare. Once students see how adherence to these requirements and rules from the laws of warfare prevent indiscriminate killing and bombing of targets, they will be asked to accept the generalization stated as the third main point and lesson objective.

LESSON OUTLINE

Main Points/Subpoints

1. (C) Adherence to requirements governing the status of parties prevents the indiscriminate killing of combatants, noncombatants, and civilians.

   a. Combatants

      (1) Soldiers in civilian clothes
      (2) Escaping POWs
      (3) Surrendering airman

   b. Noncombatants
   c. Civilians

2. (C) Adherence to rules of aerial bombardment prevents the indiscriminate bombing of possible targets in an enemy nation.

   a. Rules dictate targets
   b. Valid targets
   c. Unacceptable targets
   d. Location problems

3. (C) Adherence to laws of warfare prevents conflicts from escalating to uncontrollable death and destruction.

   a. Reasons for following laws of warfare
   b. Consequences of non-adherence
   c. Effect of bombing cities
   d. Disobeying orders
   e. Civilized warfare

PART II
TEACHING PLAN

INTRODUCTION
(3 mins)

ATTENTION: William Calley believed it was his duty to kill everyone in his operational area, including women and children, because his superior desired it.

The most common defense at Nürnberg was "I was following orders."

North Vietnam threatened to kill captured pilots because they were not combatants in a declared war.

MOTIVATION: It is obvious that crew members would have an interest in the laws of war - their lives could depend upon it.

As to the rest of us - modern war knows no front line. Is Montgomery a valid missile target? If invalid, can we resist from the hills?

Part II
TEACHING PLAN

INTRODUCTION OF GUEST: Maj Nick Grebeldinger

Education: Juris Doctorate Degree, Duquesne University
LLM (Int. Law), George Washington University in D.C.
Graduate of Armed Forces Staff College

Background: 3 yrs on Air Staff in Int. Law Division of OTJAG
2 yrs in USAFE as member of Int. Law Directorate
2 yrs at JAG School
- Advised TAC, MAC, AFLC, and AU on laws of warfare training
- Lectured on laws of warfare at AWC, ACSC, and SOS

OVERVIEW: (Review Chart)

Laws of Warfare
1. Requirements governing the status of parties.
2. Rules of aerial bombardment.
3. Importance of following the laws of warfare.

ANNOUNCE QUESTION AND ANSWER PERIOD TO FOLLOW

TRANSITION: Before entering the discussion, Maj Grebeldinger, why all the interest in laws of warfare training now?

DEVELOPMENT (30 mins)

1. (C) Adherence to requirements governing the status of parties prevents the indiscriminate killing of combatants, noncombatants, and civilians.

QUESTIONS	ANTICIPATED RESPONSES
LOQ: Why is it that a squad of soldiers operating behind the lines in civilian clothes can be shot as spies?	* Must be uniformed or else not protected.
FUQ: What is the status of an escaping POW?	* POW clothes or uniform necessary.
FUQ: Why can a surrendering airman not resist when the enemy is approaching and the odds look better than when he surrendered?	* Deceiving enemy. * Could jeopardize future captives.
FUQ: What is meant by the term "noncombatants"? How does their status differ?	* Medics, chaplains. * Separate category. * Afforded protection.
FUQ: Can civilians fight? Why, or why not?	* Not unless uniformed.

INTERIM SUMMARY: (See Notes) Summarize comments as they relate to MP1.

TRANSITION: We have seen how adherence to requirements governing the status of parties prevents the indiscriminate killing of human beings. This action helps prevent conflicts from escalating. Now, let's turn from people to objects as we examine target selection under the rules of aerial bombardment.

2. (C) Adherence to rules of aerial bombardment prevents the indiscriminate bombing of possible targets in an enemy nation.

QUESTIONS	ANTICIPATED RESPONSES
LOQ: How do the rules of aerial bombardment affect the decision on targets?	* Rules dicatate the targets that be attacked.
FUQ: Can we target downtown Moscow with a nuclear weapon under the laws of warfare? Why?	* Valid target - military targets there.
FUQ: Why is it that the Russians cannot target downtown Montgomery?	* Montgomery not a military target, though Maxwell is.
FUQ: What are some examples of targets that may be targeted and some that may not?	* Military facilities. * Hospitals, POW camps
FUQ: How could we attack a factory if it's next to a hospital?	* Precision bombing or military necessity.

INTERIM SUMMARY: (See notes) Summarize comments as they relate to MP2.

TRANSITION: We have learned some basic rules and how they are applied to prevent the indiscriminate bombing of targets. Now, let's find out what this means to us.

3. (C) That adherence to laws of warfare prevents conflicts from escalating to uncontrollable death and destruction.

LOQ: Everyone knows the enemy doesn't follow the laws of warfare - why should we?	* Court martial. * War crime trial. * You as a POW.
FUQ: How can adherence to laws of warfare preclude escalation to uncontrollable death and destruction?	* Play game or get "nuked."
FUQ: Why would it not be a good idea to bomb their cities to "bring them to their knees"?	* Sometimes unites enemy.

Part II
TEACHING PLAN

QUESTIONS	ANTICIPATED RESPONSES
FUQ: What if I am ordered to disobey the laws of warfare, i.e., attack a civilian target ...what are my choices?	* Refuse, but be right.
FUQ: How will adherence to the laws of warfare keep even the smallest war from resulting in the end of civilization as we know it?	* "Civilized" warfare.

INTERIM SUMMARY: (See notes) Summarize comments as they relate to MP 3. State lesson objective.

TRANSITION: We have some crew members present and also some instructors from the new combined air warfare course. Are there any questions for Maj Grebeldinger at this time?

QUESTION AND ANSWER PERIOD (5 mins)

CONCLUSION
(5 mins)

FINAL SUMMARY: (Summarize new material from Q&A session.)

REMOTIVATION: In time of peace it is hard to get excited about the laws of warfare. However, now is the time for us to prepare. If war comes we will be too busy to take time. Our country cannot afford another Calley. You can't afford to be the next "Calley" or have a "Calley" work for you.

CLOSURE: Thank you, Maj Grebeldinger.

PART III

TEST ITEMS

LESSON OBJECTIVE: Comprehend that adherence to laws of warfare prevents conflicts from escalating to uncontrollable death and destruction.

1. **SAMPLE OF BEHAVIOR:** Predict the effect of the U.S. not adhering to the laws of warfare.

QUESTION: (Multiple Choice)

If the U.S. elected NOT to adhere to the laws of war, what would be the MOST LIKELY effect?

- a. The U.S. public would be outraged and disposed to violence, because this action opposes our moral code.
- b. Our overseas trade would suffer because this action opposes our moral code.
- c. There would be instant diplomatic, economic, and military reprisal by other nations.

KEY: c

2. **SAMPLE OF BEHAVIOR:** Estimate the consequences of the enemy not adhering to the laws of warfare.

QUESTION: (Multiple Choice)

If an enemy refused to adhere to the laws of war, such action would MOST PROBABLY

- a. precipitate continuation of the war.
- b. enable the enemy to win the war.
- c. result in tremendous cost in manpower and resources to them.

KEY: c

3. **SAMPLE OF BEHAVIOR:** Justify why it is important to follow the rules of armed conflicts.

QUESTION: (Essay)

In 250 words or less, justify why it is important to follow the rules of armed conflict. Question is worth 40 points, and partial credit will be given. One point will be deducted for each spelling error.

KEY: A complete answer must include discussion on enforcement powers of the UCMJ (Court Martial); national and international law (war crime trials) and the expectation theory (what you would expect as a POW). Partial credit given for a complete discussion of any one or two parts. (Up to 20 points each.)

Chapter 17

THE DEMONSTRATION-PERFORMANCE METHOD

The Demonstration-Performance (D-P) method is a proven method for teaching mental or physical skills which require student practice for skill mastery. The method is based on the generally accepted principle that students learn best by doing. A person learns to swim by swimming, to drive by driving, and to teach by teaching. Skills requiring the use of tools, machines, and equipment are suited to this instructional method. Equally well suited are skills which require mathematical computations and those which are a combination of mental know-how and physical dexterity, such as taking fingerprints or fitting earplugs.

The science teacher uses the demonstration-performance method to teach laboratory procedures. The shop foreman teaches the apprentice almost entirely by some version of this method. The instructor pilot uses it to teach flying skills. The professor of medicine uses it to teach surgical skills. In each case, the instructor demonstrates the particular procedure to the students and then acts as a supervisor while they practice the skill. During the practice period, the instructor points out errors and helps students eliminate rough spots or errors in their performance. In the demonstration-performance method, the instructor shows and tells students how to do the skill, they practice under the instructor's supervision, and they are evaluated on their performance against predetermined criteria for success.

PLANNING AND DEVELOPING A DEMONSTRATION-PERFORMANCE LESSON

The demonstration-performance lesson or block of lessons consists of explanation, demonstration, performance-supervision, and evaluation phases. If all these phases are included in one continuous block or period of instruction, they are preceded by an introduction and followed by a conclusion.

The Introduction

The introduction to a demonstration-performance (D-P) lesson generally consists of the three elements recommended for all lessons: attention step, motivation step, and overview. The attention and motivation steps are the same as those discussed in Chapter 6, Developing the Teaching Plan. However, the overview for a demonstration-performance lesson may be somewhat different. In a D-P lesson, students need to know not only what they will learn, but also how they will learn it--that is, how the lesson will proceed and how they will be evaluated. Where there is potential for physical harm to students, the overview must also include safety procedures. Since beginning students often run the risk of injury while working with unfamiliar tools and equipment, instructors should continually stress safety throughout a lesson, even if only slight hazards are involved.

The Body: Explanation Phase

In the explanation phase the instructor tells the students how to perform the skill. This explanation should be planned as a short lecture with the nature of the task determining the appropriate organizational pattern. Most skills lend themselves to a sequential pattern where the skill is explained in the same step by step order normally used to perform it. When the skill being taught is related to previously taught or already known material, the known to unknown strategy may be used effectively. When teaching more than one skill in the same lesson, the simple to complex strategy works well. By starting with the simplest skill, students build confidence and are less likely to become frustrated when faced with building to more complex skills.

Another important consideration in the explanation phase is the language used. Instructors should attempt to speak at the level of the learner and avoid unnecessary jargon and technical terms that are over the head of the students. Instructors should take care to describe clearly the actions that students are expected to perform. Communication is the key. It is neither appropriate nor effective for instructors to try to impress the students with their expertise by using language which is unnecessarily complicated.

Instructional aids are particularly important in a D-P lesson. The best instructional aid is the actual equipment to be used. Other useful aids are charts, mock-ups and models. When using aids, be sure they are readable, accurate, and that all students can see them.

The Body: Demonstration Phase

In the demonstration phase (which may be combined with the explanation phase) the instructor shows the students how to do the skill. With a simple skill, the explanation and demonstration phases may be combined; with a complicated or dangerous skill, the two phases are often better separated. For example, students will probably understand a combined explanation/demonstration of flag folding; they would probably need separate steps for the use of the Weems plotter.

In the demonstration it is very important that the instructor demonstrate the skill correctly and safely the first time. When the skill is demonstrated incorrectly, the instructor may lose credibility, and students will have to unlearn the incorrectly presented material before they can learn it correctly. Learning incorrectly the first time often interferes with later learning.

The skill should be demonstrated in the same sequence in which it was explained--avoiding confusion among the students and reinforcing the steps. Since the students generally imitate the instructor's performance, the instructor must demonstrate the skill exactly the way the students are expected to practice it, including all safety procedures that the students must follow.

The Body: Performance-Supervision Phase

Before the students actually begin to practice the skill, the instructor must decide how much control to use. In the independent approach, the students practice the entire skill after seeing the demonstration, going from step to step at their own individual rate. In the controlled approach ("by the numbers"), students practice each task step (or small group of task steps) after seeing it demonstrated. With dangerous or difficult skills, the controlled approach is recommended for the first practice as a minimum. In each case, the students should practice the entire skill independently as many times as practical to achieve mastery before they are evaluated. In many cases, overlearning to ensure proficiency may be desirable.

Each student's work must be supervised to ensure safe, correct performance. If any common error or safety hazards develop, the instructor should stop the group to reteach the area of difficulty. Students should be permitted to work on their own as much as possible without unnecessary interruption or too much assistance, and the instructor should avoid distracting or non-purposeful talking or wandering. However, the instructor should not hesitate to interrupt if a student has made a mistake or is about to make a mistake. The time to identify errors is during the learning activity rather than the evaluation phase. If some students are much more proficient than others, the stronger students may assist the less proficient ones. The stronger students may also be able to make some comments or to suggest techniques which can be used by all students. In addition, the weaker students often make comments concerning their areas of difficulty which are an excellent source of information for improving subsequent instruction. In a self-paced environment, however, proficient students should not be held back when they are able to perform better and more quickly than their peers.

The Body: Evaluation Phase

The most important consideration in the evaluation phase is the development of an appropriate rating instrument or written test (see Chapters 21 and 23). To be valid, the rating device must accurately measure achievement of the criterion objective. If, for example, the conditions of the objective state that the skill will be accomplished without assistance, then the instructor must cover or remove all instructional aids, erase the chalkboard, put away work sheets, and ensure that the students actually do the skill without assistance (including assistance from the instructor).

When beginning the evaluation phase, instructors should give clear, complete instructions to the students. They should review the task steps, if necessary, and emphasize acceptable standards (time, accuracy, quality, etc.). They must allow for enough time, equipment, and supplies to evaluate all students on all standards.

At the conclusion of the evaluation phase, instructors should record the student performance on a suitable form and reveal the results to each student. Students will naturally be interested in their individual performance; however, the instructor must withhold comments that may influence other students until all have completed the evaluation. Regardless of how well a skill is taught, there may still be failures. The rule is that "success motivates," so instructors should always be positive in revealing results. When pointing out areas that need improvement, instructors should offer concrete suggestions that will help. If possible, they should avoid ending the evaluation on a negative note or criticizing a student in front of other students. Afterwards they should evaluate overall student achievement of the lesson objective and revise the instruction as necessary for future classes.

The Conclusion

The conclusion to a demonstration-performance lesson consists of the three elements recommended for all lessons: summary, remotivation, and closure. The remotivation and closure are generally the same as discussed in Chapter 6, Developing the Lesson Plan. In the summary, instructors should review the task steps with emphasis on any areas of difficulty experienced by the students. Further instruction or comments on areas of difficulty experienced by several students may be added. Areas of difficulty experienced by only one or two students may be better addressed on an individual basis.

FACTORS TO CONSIDER WHEN USING THE DEMONSTRATION-PERFORMANCE METHOD

Lesson content. A demonstration-performance is the best method for teaching mental or physical skills which require student practice for mastery. It is not recommended for cognitive or affective lessons in which student practice is not required.

Evaluation. One advantage of the D-P method is that evaluation is a part of the lesson format. The criterion objective dictates the evaluation procedures. If the criterion objective is complete, clear, and concise, there should be no surprises for the student during the evaluation.

Student-instructor relationship. When using the D-P method, the instructor must be aware of individual differences among students and be willing and able to give as much or as little individual assistance as required by each student. Students may work independently of the instructor, or the instructor can provide close, individual attention.

Time. The majority of time in a D-P lesson should be devoted to supervised practice. There is no alternative to providing sufficient time for student practice. If the students do not require practice to learn the skill, then another method is probably more appropriate.

Equipment and materials. The instructor should have all handouts, equipment, and materials ready before the lesson begins. The room or work area should be arranged to facilitate maximum space, safety, and close supervision.

Student role. Many skills cannot be performed on an individual basis and teams or partners must be assigned. Only through intensive practice can groups know exactly what to do and how to do it. If the activity is normally accomplished as a team effort, it should be practiced and evaluated as a team effort.

Group size. In many skills the size of the class or the number of work stations is critical. All students must be able to see the demonstration, and the group must be small enough so that the instructor can effectively supervise all students during the practice session. All students must have sufficient access to needed equipment, supplies, and materials.

THE SAMPLE DEMONSTRATION-PERFORMANCE LESSON PLANS

The lesson plans at the end of this chapter illustrate a format for demonstration-performance lessons from among many that are acceptable. The objective, task steps, and actual teaching plan arrangement may be varied to meet the administrative requirements of different schools or situations. On the attached plans, the criterion objective is broken down into three elements (performance, conditions, and standards) rather than written in narrative form. This separation of the elements specifies instructional intent clearly and may be easier to write than a narrative format in some circumstances.

A complete script is not desirable for the actual teaching plan. Write down enough on the teaching plan so that it will key you to the major points of the lesson. If other instructors will use the plan, spell out the examples and details more completely than if only one instructor uses it.

The attached Process/Product Evaluation Sheets are in one of many possible formats for recording the results of student evaluation. The important thing to remember when designing formats for lesson plans and evaluation sheets is to use those that will work for the particular situation within the administrative constraints of the individual school.

SUMMARY

The demonstration-performance method provides students with the opportunity to perform skills or processes which have been explained and demonstrated under controlled conditions and close supervision. Through this supervised performance, the student gains necessary skills to apply on the job or in later lessons.

When using the D-P lesson, the following factors must be carefully considered: lesson content, evaluation, student-instructor relationships, time, equipment and materials, instructor preparation, student roles, and class size.

A successful demonstration-performance lesson requires a thorough explanation, a proper demonstration, student practice with close instructor supervision to eliminate student mistakes, and a valid evaluation of student performance. If these four primary phases are effectively planned for and carefully implemented, students will have the maximum opportunity to master the skill taught.

SAMPLE LESSON PLAN
(Demonstration-Performance Lesson With Problem Solving Evaluation Instrument)

PART I
COVER SHEET

LESSON TITLE: Computing T-37 Landing Distance
INSTRUCTOR: Capt Stall
METHOD: Demonstration-Performance
ORGANIZATIONAL PATTERN/STRATEGY: Sequential

INSTRUCTIONAL AIDS: Overhead projector, overview chart, chart listing task steps

HANDOUT MATERIALS: Normal landing distance chart, practice/evaluation problems

REFERENCES: T.O. IT-37B-1

LESSON OBJECTIVE:

PERFORMANCE/BEHAVIOR	CONDITION(S)	STANDARD(S)
compute T-37 landing distance	Givens: 1. Normal landing distance chart 2. Four problems with each given: a. temperature b. pressure altitude c. gross weight d. headwind/tailwind component Restrictions: Without assistance	1. Within ± 200 feet 2. Three out of four problems correct within six minutes

TASK STEPS

Enter normal landing distance chart with given data in the following order:

- a. Temperature
- b. Pressure altitude
- c. Gross weight
- d. Headwind/tailwind component
- e. Read ground roll distance from graph

PART II

TEACHING PLAN

Introduction (3 min)

ATTENTION: Relate aircraft accident in which a C-141 ran off the end of the runway. This could have been avoided by correctly computing the landing distance.

MOTIVATION: Tell students how landing distance can affect them (any aircraft, plus future application).

OVERVIEW: Explain what will be learned. Explain how the lesson will proceed. I'll define landing distance and explain the normal landing distance chart. Then I'll demonstrate how to solve for landing distance. The students will practice the procedure: at least once with my supervision and at least once with as little help as possible. I'll then evaluate the performance of each student IAW the standards. I'll end the lesson with a brief conclusion.

Body (29 min)

EXPLANATION/
DEMONSTRATION:
(8 min)

Define landing distance. Explain the normal landing distance chart to include the scale and interpolation. Insure students can see demonstration and encourage questions. Demonstrate the procedure using the task step (twice: 1st, °C and headwind; 2nd, °F and tailwind): enter normal landing distance chart with given data in the following order:

1. temperature
2. pressure altitude
3. gross weight
4. headwind/tailwind component
5. read ground roll distance from graph

PERFORMANCE-
SUPERVISION:
(15 min)

Review standards. Hand out chart and practice problems. Remind students to use a pencil, to make small tick marks, and to work as accurately as possible. Explain that they should follow the procedure on the chart to work the practice problems. Encourage students to ask questions. Check progress of each student continually so they develop skill proficiency within acceptable standards. Reteach any area(s) of difficulty to the class as they go along.

EVALUATION:
(6 min)

Review procedure again from the chart. Reemphasize standards of acceptable performance including time available. Prepare area for evaluation by removing the task step chart and practice problem sheets, and by handing out the evaluation problems. Ask students to work the three problems IAW conditions and standards specified. Terminate evaluation after six minutes. Evaluate each student's performance and tactfully reveal results. Record results for use in reteaching any area(s) of difficulty in the summary.

Conclusion (3 min)

SUMMARY: Review lesson with emphasis on any weak area(s).

REMOTIVATION: Remind them that landing distance will be an important consideration in any aircraft they fly.

CLOSURE: Remember what we have gone over today. We will use it as a starting point tomorrow to explore a couple of new areas. See you in class tomorrow.

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MULTI-STUDENT PROCESS-PRODUCT EVALUATION
FOR PROBLEM SOLVING EVALUATION

PART III

Evaluator: ____________________

STUDENTS →

STANDARDS																		
3 of 4 problems correct to ± 200 feet																		
Problem #1																		
Problem #2																		
Problem #3																		
Problem #4																		
Within 6 minutes																		
OVERALL GRADE																		

EVALUATOR COMMENTS (weak areas, things to reteach, etc.):

SAMPLE LESSON PLAN
(Demonstration-Performance Lesson
With a Final Product Evaluation Instrument)

COVER SHEET

LESSON TITLE: Lift latent fingerprints
INSTRUCTOR: Capt Jansen
METHOD: Demonstration-Performance
ORGANIZATIONAL PATTERN/STRATEGY: Sequential

INSTRUCTIONAL AIDS: Overhead projector, chalkboard.

HANDOUT MATERIALS: Document protectors bearing latent fingerprints, brush, fingerprint powder, hinge fingerprint lifter.

REFERENCES: U.S. Department of Justice, The Science of Fingerprints, Washington: Government Printing Office.

LESSON OBJECTIVE:

PERFORMANCE/BEHAVIOR	CONDITION(S)	STANDARD(S)
Lift a latent fingerprint	Provisions: 1. Document protector with latent fingerprints 2. Brush 3. Hinge fingerprint lifter 4. A smooth nonporous surface Restrictions: Without assistance	1. Lift must have at least 12 distinguishable ridges. 2. Must be accomplished in four minutes or less.

TASK STEPS

1. Remove brush from tube and open powder container.
2. Dip brush into powder to obtain very small amount of powder on brush.
3. Brush surface of latent with gentle circular motion until fingerprint becomes clear and all excess powder is removed.
4. Pick up hinge lifter and hold in left hand so the words "Hinge Lifter" face you and are at the top.
5. Flip hinge up or open with right thumb and forefinger so the white paper is furthest away from you and the plastic is closest to you.
6. Peel back plastic protector at the top right side where the arrow is pointing toward.
7. Place tacky side of lifter over the powdered image very carefully with even motion from top to bottom.
8. Peel the lifter off the surface very carefully.
9. Close the lifter from the hinge outward by running thumb evenly down the length of the smooth plastic backing.

TEACHING PLAN

INTRODUCTION

ATTENTION: Begin with story of people changing their appearance, and then point out that one thing that cannot be changed is a fingerprint. Follow with a brief explanation of the meaning of fingerprints. Point out that every time we touch something we leave our fingerprints on the object we touched. Ask rhetorical question as to whether there is any value to fingerprints and latent fingerprints, and answer with appropriate examples.

MOTIVATION: Motivate by telling class that the skill of lifting latent fingerprints is basic to virtually every criminal investigation. It is a skill that they will be called upon to perform on a regular basis. They will not be able to discharge their duties effectively without this skill.

OVERVIEW: Explain that each student will learn how to develop and lift latent fingerprints utilizing the materials in front of them. The learning experience will occur as follows: The procedure will be explained by the instructor. The instructor will then demonstrate the procedure once. The students will then practice the procedure at least three times. Subsequent to this, an evaluation will be conducted wherein each student will develop and lift a latent fingerprint. The procedure must be accomplished within four minutes and will be judged for clearness and readability as set forth in the standard.

EXPLANATION: Describe the materials to be used emphasizing that the powder can be messy if used to excess. Explain procedure one time by going through the visual aid containing the task steps.

DEMONSTRATION: Proceed with demonstration insuring that all students can see the instructor. Encourage questions during the process. Go through the demonstration as set forth in the task steps. At the conclusion of the demonstration, show the product to class, and then place visual aid of good and bad fingerprint on the overhead projector. Carefully explain the visual standard of distinguishable ridges. Students must realize that acceptable prints will have ridges which appear clearly against the rest of the background and are not entirely black or smudged.

PERFORMANCE SUPERVISION: Place visual aid containing the task steps on the overhead projector, tell the students that they have the necessary materials, and that the document protector in front of them has a latent fingerprint within each square. Encourage questions and check student progress against the standard. After all students have practiced at least three times, terminate the practice and reteach any problem areas. Reinforce the standard of distinguishable ridges. Have students evaluate their work; then verify their judgments.

EVALUATION: Review procedure on task step aid and show aid with acceptable and unacceptable fingerprint. Remove all visual aids. Advise students they will have four minutes to complete the evaluation. Pass out new document protector bearing latent fingerprint and tell students to begin. Terminate the evaluation after four minutes. Evaluate the result of each of the students and mark each result on the product scale. Provide each student with feedback.

SUMMARY: Review task steps on the visual aid with emphasis on any weak areas.

REMOTIVATION: Remotivate by pointing out that the unique skill just learned should give each student a skill that will be used throughout their criminal investigation career.

CLOSURE: Close by saying that you hope none of them will ever have to give up a case because good fingerprints were unavailable.

MULTI-STUDENT PROCESS-PRODUCT EVALUATION
FOR A FINAL PRODUCT EVALUATION

PART III

Evaluator: ____________________

STUDENTS → STANDARDS																			
1. Lift must have at least 12 distinguishable ridges.																			
2. Must be accomplished in four minutes or less.																			
OVERALL GRADE																			

EVALUATOR COMMENTS (weak areas, things to reteach, etc.):

Chapter 18

SELECTION OF TEACHING METHODS

After deciding exactly what to teach in a lesson, the instructor determines how best to teach it or what instructional method to use. Selection of an appropriate method is an integral part of lesson planning. Certain limiting factors may prevent an instructor from using certain instructional activities. In addition to considering the lesson objective, the instructor must consider the background and ability of the students, the number of students, the time allotted to the lesson, and available facilities.

The final selection of an instructional method may very well be a compromise between the method that is most suitable to the outcome (an ideal approach) and the method that is possible under the circumstances (a realistic approach). Many variations, combinations, and adaptations can be made of any method or methods of teaching; in fact, the number of possibilities is limited only by the instructor's imagination. For this reason, the instructor should recognize the many available opportunities to help students accomplish desired outcomes.

In previous chapters, we surveyed many methods in general and examined five methods in detail. This chapter will help us to determine which method of teaching should be used under a given set of circumstances.

The decision about which teaching method to use comes in step 4 of the Instructional System Development process (see AFM 50-2). In determining the means for teaching the block or period of instruction, course planners need some systematic way to deal with the available options. The selection of teaching methods grid or decision table (Figure 18-1) fills this function. The remainder of this chapter explains this figure and describes how to use it.

We can use the grid both for evaluating existing courses and planning new ones. The grid is a synthesis of opinions of several qualified educators and their estimates based on research, logic, and practical experience. But we must use the grid with caution because these generalizations may or may not be appropriate for a specific situation or for combinations of methods.

The combination of the methods on the horizontal axis and the taxonomies and factors on the vertical axis constitute the grid. The key located to the upper left of the grid (highly recommend, recommended, etc.) is purposely written in somewhat general terms because too specific a comment would often be misleading.

The instructional methods displayed across the top of the grid were extracted and condensed from many sources. Each of the methods is briefly described in Chapter 12 of this manual. Other chapters in this handbook develop more fully at least one method from each general category. Presentational methods include the lecture, the panel, the demonstration performance, assigned readings, and self-paced instruction. Verbal interaction methods include questioning, and free and guided discussion. The application methods include practical exercises, simulations, and case study.

Figure 18-1

HR - highly recommended
r - recommended
nr - not recommended
c - comprehension level
(cognitive taxonomy)
h - higher level
(cognitive taxonomy)
lg - large class
sm - small class
Indiv - individual

	PRESENTATIONAL METHODS					STUDENT VERBAL-INTERACTION METHODS			APPLICATION METHODS			
	I. Lecture (Formal, Informal Briefing, Student Speech)	II. Indirect Discourse (Panel Discussion, Dialogue, Teaching-Interview,	III. Demonstration-Performance (Coaching, Tutoring, Operation of Equipment or Systems)	IV. Reading (Books, Periodicals, Microforms, Manuals, Handouts)	V. Self-Paced (Programmed, Modular, Computer Assisted, Mediated)	I. Questioning (Socratic Method, Student Query)	II. Discussion a. Non-Directed (Peer-Controlled Seminar, Free Discussion)	b. Guided-Discussion (Instructor-Controlled)	I. Practical Exercises a. Individual Projects	b. Field Trips	II. Simulations (Role-Playing, Games)	III. Case Studies
DOMAINS AND LEVELS												
Cognitive												
Knowledge	HR	r	nr	HR	HR	nr	nr	nr	r	r	nr	nr
Comprehension	r	HR	nr	r	HR	HR	nr	HR	r	nr	r	r
Higher Levels	nr	nr	nr	nr	r	r	nr	nr	HR	nr	HR	HR
Skill Development												
Motor Skills	nr	nr	HR	nr	r	nr	nr	nr	nr	nr	nr	nr
Mental Skills	nr	nr	HR	r	HR	r	nr	nr	r	nr	nr	nr
Affective												
Lower Levels	r	HR	nr	r	r	r	r	HR	r	HR	HR	r
Higher Levels	nr	nr	nr	nr	nr	nr	nr	nr	HR	r	HR	HR
FACTORS AND CONSTRAINTS												
Minimum Level of Instructor Expertise	c	c	h	h	h	h	n/a	h	h	c	h	h
Class Size	lg	lg	sm	Indiv	Indiv	sm	sm	sm	Indiv	sm	sm	sm
Evaluation Inherent in Method	no	no	yes	no	yes	yes	no	no	yes	no	yes	yes
Responsive to Individual Needs	no	no	yes	yes	yes	yes	yes	yes	yes	no	yes	yes

As we approach the task of deciding which teaching method should be used, we also need to consider certain criteria listed to the left of the grid. These criteria are all fully explained later in this chapter and elsewhere in this manual.

First, the instructor should consider the primary domain of learning involved, the cognitive, the psychomotor, or the affective. In the cognitive domain, the grid considers knowledge and comprehension levels, but groups the remainder of the taxonomy levels together as "higher levels." Generally the same teaching methods work for application, analysis, synthesis, and evaluation. Similarly, the affective domain is divided roughly into lower levels (receiving and responding) and higher levels (valuing, organization, and characterization). The psychomotor domain also has a taxonomy, but for purposes of the grid, it is divided simply into motor and mental skills.

All who plan instruction must deal with the realities of their situation--resources, space, and class size. These items are grouped together as factors and constraints. Instructor expertise is always a consideration, particularly when the instruction contains complex procedures or involves high levels of cognitive learning. Class size is another important factor, and if very large, class size may cause planners to select a less desirable method than they would prefer. Evaluation becomes more difficult at the higher levels of learning. But some methods provide ways in which instructors can do some evaluating during the learning process. Case study and other simulations are good examples. Similarly, some instructional methods permit instructors to respond to individual student needs better than others. The lecture, for example, rates low in providing opportunities for instructors to modify their instruction to deal with the fast or slow learner; small group methods, on the other hand, lend themselves to more individualized student treatment.

Many other critical factors and constraints affect the selection of teaching methods. These additional considerations may be as significant as those discussed above and often combine to create even more difficult decisions regarding the selection of appropriate teaching methods. Among the other significant factors which affect the selection of teaching methods are the:

- need for a specially equipped facility
- amount of time needed to develop instruction
- cost to develop and maintain both the hardware and software which support the method
- availability of support people to develop and maintain the hardware and software necessary to use the method effectively

ASSUMPTIONS

To realize the most practical value from this grid, we should be aware of four assumptions:

- The terms and categories follow the definitions and conditions found in the accompanying narrative. Terms used in a specific course or school may be defined differently. Most terms, however, are consistent with AFM 50-2 and the taxonomies of Bloom and Krathwohl.
- The periods or units of instruction being analyzed are assumed to be relatively short, from one period to a short block of instruction. Extended periods of instruction present many considerations beyond the scope of this grid.

- The methods are analyzed in their "pure" form, that is, not combined with other methods. The greater the combination of methods, the more we must exercise caution in using this grid. A method which is not recommended as an exclusive approach to instruction may be highly recommended in combination with another method.

- A reasonable quality of materials and adequate teaching skills must be available. Poorly prepared materials and weak instructor skills would have a serious negative effect on all recommendations. Conversely, the "great teacher," the "master" of a particular method, or extremely well-prepared instructional materials might have an impact well beyond those normally expected.

With an understanding of these assumptions, the grid can be of considerable value as a basis for evaluating methods of instruction. While these assumptions may affect the interpretation of the grid, the grid's recommendations will be useful for all schools and courses under most normal situations. At the least, these recommendations will help identify periods or blocks of instruction which require further analysis.

A school may often find itself with an effective instruction system where the methods used are as good as or better than those recommended. However, situations which are markedly different from these recommendations should be carefully examined to ensure that the methods chosen are not a result of error or inertia.

DEFINITION OF TERMS

The following definitions should be kept in mind as the basis for the ratings given for the methods discussed further on.

Domains and Levels (See Chapters 4 and 10)

Cognitive Domain

Lower Levels

Knowledge. The recall of previously learned material (facts or theories) in essentially the same form taught.

Comprehension. Seeing relationships, concepts, and abstractions beyond the simple remembering of material. Typically involves translating, interpreting, and estimating future trends.

Higher Levels

Application. The ability to use learned material in new and concrete situations, including the application of rules, methods, concepts, principles, laws, and theories.

Analysis. The ability to break down material into its component parts so that the organizational structure may be understood, including the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved.

Synthesis. The ability to put parts together to form new patterns or structures, such as a unique communication (a theme or speech), a plan of operations (a research proposal), or a set of abstract relations (schemes for classifying information).

Evaluation. The ability to judge the value of material for a given purpose. Learning in this area is the highest in the cognitive hierarchy because it involves elements of all the other categories, plus conscious value judgments based on clearly defined criteria.

Skill Development. Although skill development is not normally considered a domain of learning, it appeared useful here to differentiate between those skills which are primarily motor in nature and those that are primarily mental.

Motor Skills. Those skills associated with neuro-muscular responses which are learned primarily through physical repetition (i.e., typing, most athletic skills, shopwork, etc.).

Mental Skills. Those skills in which cognition is of primary emphasis (i.e., math skills, computer operation, speaking, writing, etc.).

Affective Domain

Lower Levels

Receiving. The getting, holding, and directing of the student's attention, from the simple awareness that a thing exists, to selective attention on the part of the learner.

Responding. The student not only attends to a particular phenomenon but also reacts to it in some way, such as acquiescence (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). Includes instructional objectives related to "interests."

Higher Levels

Valuing. The worth or value a student attaches to a particular object, phenomenon, or behavior, ranging from acceptance of a value to commitment. Includes instructional objectives related to "attitudes" and "appreciation."

Organization. The bringing together of different values, resolving conflicts between them, and the beginning of building an internally consistent value system. Includes instructional objectives related to "philosophy of life."

Characterization by a Value or Value Complex. Pervasive, consistent, and predictable behavior (life style) developing from a value system which controls behavior for a significant period of time. Instructional objectives focusing on personal, social, and emotional adjustment are in this category.

Factors and Constraints

Minimum level of instructor expertise. The minimum level of understanding in the cognitive domain required to teach a particular method of instruction effectively.

Class size. The optimum number of students for teaching a particular method of instruction. Recommended numbers (where applicable) are given in the narrative for each method.

Evaluation inherent in method. Does the method itself provide the basis for evaluating attainment of objectives, or is a follow-up evaluation device required?

Responsiveness to individual needs. Does the method allow for active student participation and produce opportunities to express viewpoints? Does the method allow for different levels of student achievement or allow students to work at their own pace?

RECOMMENDATIONS FOR TEACHING METHODS

The remainder of this chapter is a detailed narrative describing the rationale for the ratings given for various teaching methods based on the above definitions.

Lecture

DOMAINS AND LEVELS

Cognitive Domain

Knowledge (HR). Highly recommended when the basic purpose is to disseminate information and the material is not available elsewhere. Also works well for arousing interest in a subject and in organizing content for presentation in a particular way for a specific group. Especially suitable to content which must be continually updated or revised by the expert. However, the instructor should realize that material presented will be remembered for only a short time unless reinforced through use of another teaching method or real-life experience.

Comprehension (r). Most efficient at the knowledge level, but it may also be used at the comprehension level, particularly when the lecture is informal. Recommended only if the faculty-student ratio is too high for small group activities. More formal approach recommended for a very specialized subject area in which faculty expertise is at too low a level to use small group activities effectively.

Higher Levels (nr). Not recommended since active student involvement in the learning process is generally needed.

Skill Development

Motor Skills (nr). Limited use because the lecturer is primarily a "saying" method which makes it less appropriate for instruction in "doing." The explanation phase of a demonstration-performance lesson used in teaching psychomotor skills might be presented as a formal or informal mini-lecture.

Mental Skills (nr). Useful only in the introductory phases of mental skills for such topics as rule formation, formulas, and factual material associated with the use of equipment. Although such material could also be taught through reading or programmed texts, the informal lecture, with its inherent use of questions, might be more effective in dealing with differing student backgrounds and complex factual material.

Affective (r). A lecturer may develop a rational argument aimed at producing actual changes in student overt behavior; however, passive participation by the students is likely to lead to little more than an awareness of the new material and perhaps some intellectual conviction about the appropriateness of the new behavior. May be used for reaching lower affective levels, such as an informal lecture near the end of a block of instruction. (NR) Not recommended for higher affective objectives.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (c). If a lecture is only to the knowledge level, instructor expertise at the comprehension level is the minimum requirement.

Class Size (lg). As long as the instructor can be seen and heard, the size of the class is not important. Under certain circumstances, an informal lecture to a small group may be just as defensible as a formal lecture to a larger one. In a very large hall, if students cannot be close enough to make eye contact with the lecturer, communication may suffer.

Evaluation Inherent in Method (no). No opportunity to estimate how well the students are learning the material, except in an informal lecture to a very small group.

Responsive to Individual Needs (no). Except in an informal lecture to a small group, does not allow students to formulate questions and have the questions answered before proceeding to the next area of instruction.

Indirect Discourse

DOMAINS AND LEVELS

Cognitive Domain

Knowledge (r). While these methods could be used for factual knowledge, other methods are better suited at this level.

Comprehension (HR). Especially suited for providing bases for abstractions, for airing multiple points of view, and for drawing together data to form generalizations for the student to arrive at conclusions. Hence, these methods are ideally suited to the development of student comprehension.

Higher Levels (nr). Since there is no requirement for the students themselves to put any abstractions to use in new situations, these methods are not recommended for the higher cognitive levels. They are, however, an excellent basis for later application of the higher levels by other methods.

Skill Development (nr). Not suitable for developing motor or mental skills.

Affective Domain

Lower Levels (HR). One great strength of indirect discourse is the development of lower level affective outcomes. Activities such as panel discussions, teaching interviews, and dramatizations go a long way towards encouraging student reception and response.

Higher Levels (nr). While it is possible to obtain valuing under certain circumstances, the higher affective levels are generally beyond the scope of methods of indirect discourse, because, with the exception of question and answer periods, active student involvement and application are usually not possible.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (C). Since the methods of indirect discourse can be used to develop knowledge level skills but are best suited to the comprehension level, the minimum level of instructor expertise must be the comprehension level.

Class Size (lg). While there is no optimum class size for these methods, an advantage of indirect discourse is that it can be used for extremely large groups of students, so long as they can see and hear. These methods have also been very successful with small groups (8-12).

Evaluation Inherent in Method (no). The measurement or evaluation of student learning is not an inherent part of indirect discourse. The teacher has no way of knowing at the end of the lesson whether the students have learned or not. Some additional form of evaluation is necessary to determine if students have met the planned objectives. The only exception would be a question and answer period where the nature and quality of student questions might be an indirect way of evaluating students. Not all students, however, may get to ask questions and others may choose not to ask them. Either way, incomplete and inadequate evaluation is the result.

Responsive to Individual Needs (no). If these methods do not include a question and answer period, as is often the case, they are not very responsive to individual needs. Issues or questions of interest will never surface unless students are allowed to pursue them in some way. By themselves, the methods of indirect discourse do not permit student's needs to be satisfied.

Demonstration-Performance

DOMAINS AND LEVELS

Cognitive (nr). Methods of teaching which rely heavily on demonstration are not efficient and effective ways of transmitting cognitive subject matter. While factual information is often transmitted during the course of a lesson involving demonstration, such methods are not recommended for achieving cognitive objectives other than mental skills.

Skill Development (HR). Particularly well suited to the development of both physical and mental skills. Lessons which rely on teacher demonstration of skills generally lend themselves to quite precisely stated objectives, which are relatively easy to measure and require practice to acquire. Although the method is usually associated with psychomotor skills, it is also effective with mental skills, such as computation, writing, and construction of graphs. Because students actively participate in learning physical or mental skills, teachers have access to trial behavior to which they can respond and provide precise feedback. Such feedback is essential in shaping student behavior to achieve the skill level desired.

Affective (nr). Not recommended for lessons designed to affect attitudes. Although a change in attitude may come about from any learning experience, other methods lead to attitude change more directly. One exception is technical training which often seeks to develop positive attitudes for factors like safety and accuracy during demonstration lessons.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (h). Considerable proficiency in the skill being demonstrated is critical to the success of this method. As observation is usually a critical element in demonstration-performance, instructor error in the physical or mental skill can be particularly confusing to the learner. In addition, the instructor must be able to anticipate learner error, analyze the causes, and provide exact feedback which will allow the learner to perform satisfactorily.

Class Size (sm). A particularly sensitive variable in a demonstration-performance, varying from individual instruction to small groups. Educational technology has had little effect on increasing group size in skill development lessons. To the contrary, most sophisticated applications of educational technology tend to make demonstration learning experiences more and more individualized while increasing the size of the potential audience.

Evaluation Inherent in Method (yes). Easily accommodates evaluation. The instructor, though, should not accept the practice of the skill as proof of skill attainment, and a separate evaluation step must be incorporated into the lesson.

Responsive to Individual Needs (yes). Because the demonstration-performance relies so heavily on student-teacher interaction, it readily accommodates individual needs. Instructors can readily tell what students can and cannot do and prescribe appropriate learning experiences.

Reading

DOMAINS AND LEVELS

Cognitive

Knowledge (HR). For the majority of students, the most effective and time-efficient means of presenting knowledge level material. Students proceed at their own pace and are free to adjust at will to the learning experience. They are limited only by reading speed and comprehension, both of which may be improved through special courses.

Comprehension (r). Although a student can reach the comprehension level through carefully selected readings, other methods which ensure interaction with the instructor or other students may be preferable. When such interaction is not possible, correspondence courses are an acceptable alternative, especially when combined with study or review questions or other activities which require the student to manipulate the material.

Higher Levels (nr). Because application, analysis, synthesis, and evaluation require the student to interact to the material in more complex ways, reading is not a recommended method to reach these levels.

Skill Development (nr/r). Although students may read how to do a motor or mental skill, the method by itself does not ensure that they can actually perform the task. Formulas, procedures, and task steps can be read, but to expedite skill development, a demonstration-performance is recommended. Some relatively simple mental skills might be learned from reading if it is the only method available; however, some sort of programmed learning is probably preferable to straight reading.

Affective (r/nr). Whether attitudes can be influenced through reading depends on such factors as the writer's skills. Therefore, reading is recommended for teaching the lowest level of the affective domain (receiving), but there is no assurance that responding or any of the higher levels will be reached. Because of individual differences, it is difficult to be sure that reading materials will actually lead to the desired affective objective.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (h). Because the instructor's only control in this method is the selection of what students read or the direction of their research, the instructor's expertise should be at the higher levels of the cognitive taxonomy.

Class Size (Indiv). Class size is a factor in reading only when all members of a class must have access to a limited number of copies of a particular reading. With preplanning and modern methods of duplication, such problems are easy to avoid. Some techniques for making reading materials more available to students are textbook issue (especially a "walking library"), reserve book rooms or shelves, classroom bookshelves, the reproduction of microforms into readable copy, and multiple library copies. For an effective research program, specialized facilities such as libraries, archives, reference materials, and staff are essential.

Evaluation Inherent in Method (no). Not inherent so that the instructor must provide evaluation separately.

Responsive to Individual Needs (yes). Although reading is highly responsive to the needs and differences of individual students, the instructor must not neglect the factor of student motivation. Many students do not like to read or have not developed disciplined study habits, and these factors may be more significant than the relatively few students who have problems with comprehension or reading speed. Because the instructor is normally not present when the reading takes place, controls and well-defined goals are all the more important.

Self-Paced Methods

DOMAINS AND LEVELS

Cognitive (HR/r). The wide-ranging applications of the various self-paced methodologies indicate potential over the whole range of cognitive levels. Great numbers of learners have mastered basic factual information as well as advanced concepts and principles through the use of programmed instruction and mediated objectives from simple knowledge to complex tasks requiring application level and beyond. Materials and methods such as these are very tolerant of learners, permitting them to select their own pace of learning, review the material as they see fit, and redo the lesson until the material has been mastered. This characteristic allows these methods to accommodate individual learning rates for cognitive objectives.

Skill Development (r/HR). Successfully employed in motor skill development, but particularly well suited for the development of mental skills. A combination of self-paced materials and instructor intervention is strongly recommended as a highly efficient and effective approach to skill development. The same characteristics of these methods which make them well suited for general cognitive development also make them appropriate for mental skill development.

Affective (r/nr). Most of the methods which have man/material or man/machine interaction rather than human interaction cannot be highly recommended for affective development. Various self-paced methods may enhance a student's attitude towards the subject matter, but they are unlikely to effect change in value systems or to help reach higher affective levels.

FACTORS AND CONSTRAINTS

Minimum Levels of Instructor Expertise (h). Preparing materials for use in the self-paced methods requires a very high level of instructor expertise in the subject matter, perhaps rivaled only by simulation and case study methodology. Self-paced methods also require considerable technical skill in their design. Programmed instruction and modules demand careful attention to a fairly rigid set of rules as well as considerable development time and field testing. This requirement for both subject matter and technical expertise puts the various self-paced methods among the most difficult, time-consuming, and costly to produce. The educational benefits realized from the methods must be carefully weighed against these factors.

Class Size (Indiv). By the nature of their construction, self-paced exercises are directed towards individualized learning. Because most of these exercises are capable of being mass-produced, large audiences can be reached by these methods, although the mode of delivery is individualized.

Evaluation Inherent in Method (yes). A basic ingredient in all self-paced instruction is ongoing evaluation of learner progress towards established learning objectives. Many forms of self-paced instruction have carefully prepared systems for pre-, post-, and formative testing. Often the evaluation step is so intermingled in the instructional materials that the learner may not consider it to be a "test" in the usual sense.

Responsive to Individual Needs (yes). Particularly responsive to student needs and differences. Properly prepared, the methods can incorporate such sound learning principles as positive reinforcement and immediate feedback. These principles allow students with various needs and motivation levels to be successful. In addition, various technical treatments such as branching programs (special tracks) provide additional capacity to deal with individual needs and differences.

Questioning

DOMAINS AND LEVELS

Cognitive

Knowledge (nr). Although theoretically possible at the knowledge level, not recommended because most questioning results in too much recitation and response in an elementary rote-learning classroom. Other methods are more productively used for the presentation and reinforcement of knowledge-level material.

Comprehension (HR). Lends itself best to material at this level because the instructor can lead the student or class to form concepts, test them, and see their interrelationships through a series of skillfully chosen questions.

Higher Levels (r). Although it is possible to question at the higher cognitive levels (analysis, synthesis, evaluation), these levels lend themselves to more student interaction than is easy with one-on-one questioning. Questioning can be used to stimulate thinking at the higher levels as a preliminary step for the student.

Skill Development

Motor Skills (nr). Except at very low levels of physical skill development where an instructor wants to check on simple knowledge of facts or procedures, questioning by itself does not develop motor activity.

Mental Skills (r). An effective technique for developing mental skills.

Affective

Higher Levels (nr). Not recommended for the higher levels (valuing, organization, characterization) of the affective domain because it provides for too narrow a range of student response and initiative.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (h). For fully exploiting the potential of the questioning method, instructors should be at the evaluation level, i.e., highly skilled, because the method requires immediate evaluation of student responses and expert competence in the subject to see the logical consequences of a line of reasoning or to form new approaches. Instructors with a specially analytical mind who enjoy the give and take of lively interchange will find this method effective in achieving instructional objectives.

Class Size (sm). Although law schools use the questioning method to good purpose in very large lecture halls (100 and more students), the method would seem to lend itself best to one-on-one or small group (8-12) instruction.

Evaluation Inherent in Method (yes). The fact that instructors receive immediate response to their questions and are in a position to evaluate these responses before proceeding to the next question rates this aspect very high.

Responsive to Individual Needs (yes). If the instructor is able to use a number of spontaneous questions instead of relying on planned questions, the method can be very responsive to student needs and differences.

Discussion/Non-Directed

DOMAINS AND LEVELS

Cognitive (nr). Although the peer-controlled seminar can discuss knowledge or even comprehension level materials, there is also the danger that the seminar will pool ignorance. Clearly defined objectives and a means of measuring their achievement can provide the focus for learning.

Skill Development (nr). Does not lend itself to developing either motor or mental skills.

Affective

Lower Levels (r). The only recommended use for the peer-controlled seminar is for receiving and responding to affective material. The great difficulty in writing affective classroom objectives, though, makes even this area of limited usefulness. A possible use of professional military education might be for seminar discussion following a guest speaker whose primary reason for addressing the group was motivational (such as a war hero or a popular leader). If properly motivated, the group might share and reinforce the affective experience among themselves, but without strong leadership even this limited objective might not be met and the session might just as easily deteriorate into free discussion.

Higher Levels (nr). Not recommended for the higher levels of the affective domain. These levels require disciplined effort under a trained leader to be effective.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (n/a). Not applicable, because of the instructor's limited or passive role in a peer-controlled seminar, which is, of course, one of its weaknesses. If qualified students are available and properly supervised, such seminars can be successful.

Class Size (sm). The small group (8-12 students) is probably the most common and workable size for the peer-controlled seminar. Any larger class would be too unwieldy.

Evaluation Inherent in Method (no). With the instructor playing a passive role there is little evaluation in the usual sense. However, it is possible to obtain evaluation information if an individual or group product is required.

Responsive to Individual Needs (yes). As the seminar is entirely run by the students, it is obviously responsive to individual interests, but not necessarily to their educational needs. There is the danger that the natural leaders in the group will dominate the class to the exclusion of weaker students.

DOMAINS AND LEVELS

Cognitive

Knowledge (nr). Not recommended for simple recall of factual information. Other methods such as the lecture, reading, or self-directed instruction are more efficient for reaching this level.

Comprehension (HR). Designed almost exclusively for this level and one of the most efficient ways of reaching it. The method develops concepts and principles through group process and the unobtrusive guidance of the instructor. Properly conducted, the guided discussion also ensures that each student learns at this level, as the instructor can draw out an individual student who may not be participating voluntarily. Unlike free discussion, which probably has no objective and which develops solely by the natural direction the group happens to take, the guided discussion is highly structured, with planned questions which lead the group to a specific, predetermined goal.

Higher Levels (nr). Rarely reaches the higher levels of learning as students are not required to put the concepts they have learned to use in new situations as in some of the application methods.

Skill Development (nr). As there is no student "doing" in the guided discussion, only verbal interaction, this method is not recommended for teaching motor or mental skills.

Affective (HR/nr). By participating in a guided discussion, students are exposed to the opinions of others and are forced to defend their personal positions. For this reason, the method is more suited to receiving, responding and valuing than to organization and characterization.

FACTORS AND CONSTRAINTS

Minimum Level of Experience (h). Although it is possible for instructors in guided discussions to be at the comprehension level, ideally they should be at the higher levels. One primary responsibility of instructors is the ability to judge the worth of student responses, since achieving the planned objective is totally dependent on the use of student responses to form the generalization. Since instructors cannot possibly use all student responses, they must have the ability to select those which are most relevant to the concept or principle under discussion. As the method is a new one for most instructors, a certain amount of training is necessary, but once an instructor has the basic idea, there is no difficulty in applying the technique to different situations.

Class Size (sm). Although 8-12 students might be considered an optimum size, the method can be used very satisfactorily with a slightly larger or smaller group. However, as the size of the group moves above the optimum, it becomes somewhat harder to control the discussion, thus calling for more instructor expertise in conducting discussions.

Evaluation Inherent in the Method (no). Since students are not normally asked to actually formulate and verbally express their own generalizations, some other type of follow-on evaluation device is necessary. However, if time is available and if students can be asked to express their own generalizations, then instructors might be able to evaluate achievement of the objective.

Responsive to Individual Needs (yes). Does an excellent job of meeting individual needs. Each student is encouraged to express opinions on issues and to ask questions about issues raised by others.

Practical Exercises - Individual Project

DOMAINS AND LEVELS

Cognitive

Knowledge and Comprehenson (r). Can be used to teach at these levels, but they do not use the method's full potential. Usually students will need to acquire mastery at these levels before the project starts, usually through other means, such as reading.

Higher Levels (HR). One of the best methods for ensuring learning at the higher cognitive levels of application, analysis, synthesis, and evaluation--all of which are difficult to reach by most other means. Properly directed, individual research gives the students maximum flexibility to pursue interests at their own speed, while at the same time allowing them to reach their capabilities and insights. Individual projects combine well with other methods such as the research seminar which allows the student to work independently and also interact with peers and the instructor.

Skill Development

Motor Skills (nr). Not recommended for the development of motor skills. While students may sharpen such skills while working on a project, other instructional methods, such as demonstration-performance, are more efficient.

Mental Skills (r). May be useful in developing mental skills, and the skill could be an integral part of the desired objective. But the project is not highly recommended for mental skills as the demonstration-performance method is more appropriate.

Affective

Lower Levels (r). Students could be influenced affectively during an individual project to pay attention (receive) and actually take some action (respond) to the material. However, for the most part, receiving and responding skills are assumed to already be present before a student undertakes a project.

Higher Levels (HR). An excellent means by which attainment of the higher affective levels may be judged. Whether a student values certain materials, techniques, or ideas is often easy to determine during the conduct of a project. The same can be said of organization and characterization as well. Frequent contact between student and instructor are an important part of the method, and there is opportunity for regular feedback and guidance. The instructor who is properly attuned to what to look for will find indicators of the higher affective levels in this method.

FACTORS AND CONSTRAINTS

Minimum Levels of Instructor Expertise (h). Since the higher cognitive levels are desired in this method and since students will be required to sift and evaluate data, equipment, or persons, it is essential that the instructor be operating at the higher levels of the cognitive taxonomy.

Class Size (Indiv). The actual instruction and interaction between student and teacher is usually on a one-to-one basis. There is a practical limit to the number of individual projects which can be supervised at one time.

Evaluation Inherent in Method (yes). Since student and teacher interact regularly and since finished portions of the project are evaluated and critiqued as the endeavor proceeds, it is clear that student progress is monitored constantly. Hence, knowledge of what students can do and how they are doing it is readily available.

Responsive to Individual Needs (yes). With the continual interchange between instructor and student, instructors will find it easy to identify and deal with student's special weaknesses, interests, and needs.

Practical Exercises - Field Trip

DOMAINS AND LEVELS

Cognitive (r/nr). With some exceptions, typically used for affective purposes rather than for cognitive development. For this reason, it is difficult to visualize how comprehension, application, and the higher levels can be developed in the student as the result of a field trip. Certainly some factual information may be learned--in some cases a great deal of factual information--but one would not highly recommend the field trip for this purpose since there are other more appropriate methods (e.g., lecture, reading).

Skill Development (nr). Typically provides no opportunity for the development of either motor or mental skills.

Affective (HR/r). Highly recommended as a method to influence all levels of student affect. The field trip experience may gain the attention of some students (receiving) and evoke responses in others (responding). Value or worth may be seen in an object or idea as the result of a field trip and, while it is difficult to attain, this method can be a strong factor in the achievement of the highest affective levels.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (c). An instructor need not be at the highest cognitive levels to participate in a useful field trip for students. However, the instructor must be at the comprehension level at least in order to make proper use of the method. The selection of the field trip location and activities, the asking of meaningful questions during the trip, and the possible discussion of the trip afterward would all require at least comprehension on the part of the instructor. Since the field trip may be used primarily for affective purposes, it is recommended that the instructor be at the higher levels of the affective taxonomy.

Class Size (sm). Many variables determine optimum class size for a field trip, but the number of students per instructor should be small. All students need to observe and experience the important elements of the field trip and be able to interact with either the instructor or a relevant expert at the field trip site.

Evaluation Inherent in Method (no). As an experiental teaching method, formal evaluation is not possible. Some additional form of evaluation would be necessary to measure objective achievement.

Responsive to Individual Needs (no). Generally speaking, not a method which meets an individual student's needs. The typical field trip is a highly structured and scheduled affair which leaves little time for students to satisfy their needs with regard to the topic. The addition of a question and answer period helps in this regard, as do post-field trip discussion.

Practical Exercises
Simulation

DOMAINS AND LEVELS

Cognitive

Knowledge and Comprehension (nr/r). Not recommended for imparting knowledge to students. As a matter of fact, knowledge is a prerequisite for this method. While simulation can be a vehicle through which the development of comprehension can occur, most simulations also imply a prerequisite of comprehension level functioning.

Higher Levels (HR). One strength is the provision of an opportunity for students to operate at the highest cognitive levels within a low risk environment, as in war games, role-playing, and computer simulations in general. Most simulations require some sort of analysis, synthesis, and evaluation, while practically all simulations require the application of concepts and principles in new situations.

Skill Development (nr). Hardware simulators (such as a cockpit or missile trainer) are excellent adjuncts to both physical and mental skill development (coordination in flight, locations of instruments and controls, emergency procedures).

Affective (HR). Another strength is the direct relevance to affective development. Can be instrumental in the achievement of all affective levels. For example, observing or participating in a simulation may be responsible for student attention and action (receiving and responding). Since the simulation deals with putting learned material to use, the higher affective levels are also addressed.

Students begin to see worth or value in certain principles, ideas, or equipment, and this insight is the stepping stone to organization and characterization.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (h). The instructor in a simulation must be at the highest cognitive level to use these methods properly. Since the students are often operating at the evaluation level, it is essential that the instructor be at this level also. Though more passive in this method than in others, the instructor must still be ready to act and answer on request or whenever necessary.

Class Size (sm). While there may be large numbers of students involved in any given simulation, there must be few students per instructor or reference during the simulation itself. Without this guidance, students will flounder and not get out of the simulation what they might.

Evaluation Inherent in Method (yes). Most simulations provide immediate feedback to instructor and student alike. Unless one is interested in measuring knowledge or comprehension prerequisites or post-simulation outcomes, the proof of learning in a simulation is the adequate handling of whatever task is involved. Hence, no other evaluative device is required.

Responsive to Individual Needs (yes). Because of the simulator/student and instructor/student interaction and immediate feedback, the simulation does provide for individual student needs. Various simulations or portions of simulations can be run and repeated until adequately dealt with by the student. Weaknesses and strengths can be quickly identified and worked with as appropriate.

Practical Exercises/ Case Studies

DOMAINS AND LEVELS

Cognitive

Knowledge (nr). Not recommended for teaching at this level, as its efficiency compared to other methods is poor.

Comprehension (r). Although the case study can be used to teach to this level, normally other methods such as the guided discussion or the indirect discourse methods are more efficient.

Higher Levels (HR). One of the best teaching methods for reaching the higher levels of the cognitive domain. Very effective both for applying a single principle or concept and for evaluation a situation involving total analysis and synthesis. The primary limitation is the absolute necessity for students first to have a thorough comprehension of the concepts and principles involved. For this reason, the method is often used as a "capstone" to other methods at the end of a block of instruction.

Skill Development (nr). Not recommended in this area, as the demonstration-performance is a far more efficient means of developing both motor and mental skills.

Affective (r/HR). The use of the case study in this domain very closely parallels its use in the cognitive domain. Although a good method for reaching lower level objectives, other methods such as the guided discussion and field trips are more efficient if the affective objectives are solely at the lower levels. Highly recommended for the higher levels as students are forced to recognize the role of systematic planning and objective approaches to problem solving. They are also forced to defend positions which in many cases are a synthesis of their own value systems.

FACTORS AND CONSTRAINTS

Minimum Level of Instructor Expertise (h). Because of the high levels associated with this method, the instructor should be at the higher levels in order to evaluate students responses. The factor of instructor expertise is one of the primary limitations of the case study method in schools with large faculties where all students are receiving the same instruction in seminars.

Class Size (sm). Class size in the case study method is perhaps more a function of time than any other one factor. All students must be prepared to present their thoughts on the subject under consideration. Time must be available for other students or the instructor to analyze critically the proposals presented by each student. Although some authors writing on the case study recommend 8-12 students as an optimum number, a variation is used quite satisfactorily in large classes where adequate time and facilities are available. The average seminar size in AF professional military education schools is very well suited to the use of this method.

Evaluation Inherent in Method (yes). Since students must give their own proposals or at least critically analyze the proposals of others, the instructor has an excellent opportunity for on-the-spot evaluation of student achievement of objectives. If the method is properly conducted, no follow-up evaluation is necessary.

Responsive to Individual Needs (yes). Since students are free to develop their own approaches to the situation, the method is easily accommodated to individual needs and differences.

SUMMARY

The Selection of Teaching Methods Grid can be of real value in determining the appropriateness of proposed or existing methods of teaching. Used with some caution, the recommendations within the grid will be useful for most schools and courses. Such recommendations should form the basis to identify periods or blocks of instruction which may require further analysis.

A situation which is inconsistent with the recommendation of this grid is not necessarily a poor one. The methods being used may be as good as or better than those recommended. However, situations which are markedly different from these recommendations should be carefully examined to ensure that the methods chosen are not a result of error or inertia.

This grid is recommended for use in any educational setting. The impact of methodology upon learning can be significant. Appropriate methodology should enhance the learning of knowledges, skills, and attitudes. This grid for the Selection of Teaching Methods can be of value to maximize the achievement of objectives in the educational setting.

Chapter 19

VISUAL AIDS AND INSTRUCTIONAL MEDIA

In the preceding chapters, we learned that the selection of a method for a particular teaching situation is far from an accidental process. In order to reach our teaching objective most efficiently, we must carefully consider the advantages and limitations of each method. The same care is needed for the selection of instructional aids that will support our lesson and make our teaching task easier. The purpose of this chapter is to assist us in selecting visual aids and other instructional media.

Besides giving support for our teaching, instructional aids have other roles. Some media aids can be used to "teach" an entire lesson, as often occurs with television or computers. Courses which rely heavily or primarily on audio and visual materials to deliver instruction must be particularly concerned about the validity of their course ware. Section 5-4, AFM 50-2 and Section D of Volume IV, AFP 50-58 are particularly detailed discussions of methods and techniques to validate instructional aids and other materials. But for most Air Force instruction, aids will be used primarily to support classroom lessons, and the material in the chapter should be sufficient.

In its broadest interpretation, aids (or instructional media) include anything which assists students in their learning--even instructors and textbooks. In this chapter, however, we will look first at the more basic forms of media (instructional aids) which give audio or visual support in a classroom setting. Even though many of the media covered will be familiar, we will try to present techniques that will improve their usefulness. Later in this chapter we will cover some of the more technical media applications in areas other than classrooms, such as learning centers and computer-assisted and -managed instruction. While detailed coverage of all aids is beyond the scope of this manual, we will try to describe the primary advantages and disadvantages of each and suggest references for further study where appropriate.

What are the factors an Air Force instructor must consider in selecting instructional aids? Ideally, the type of aid should be determined by the lesson objective. For example, if a learning outcome requires students to identify or recognize an item or process, the instructor would likely select a medium which visually displays the item or process. Having made this decision, the next step is to determine which form of visual aid is best by asking the following questions:

- Must the actual item or process be seen or will a replica do as well?

- Is motion required?

- Is color required?

- Will a large number of students view the visual aid at the same time and place or will time and location vary?

- Have you surveyed existing aids to determine whether the materials you require are already available?

- Is the equipment available to display the visual aid?

The answers to these questions will help us select our aids. Frequently, trade-offs will be necessary. For example, the cost of producing a color film may be prohibitive, or a closed circuit television system may not be available. Because the availability of equipment and material may dictate the teaching method we select, it is important to combine the method and media selection process. When a long lead time or budget limitation is involved, the media selection process may have to occur as early as Step II of the Instructional System Development process.

Additional information on the use of instructional media and their place in the ISD process can be found in Chapter 5, AFM 50-2, Instructional System Development, and Chapter 5, AFP 50-58, Vol IV, Handbook for Designers of Instructional Systems. Specific techniques for lettering, making transparencies, and constructing many of the visual aids discussed here can be found in AU-1 (Communications Skills), Volume VIII, Easy Visual Aids.

CHALKBOARDS. Chalkboards are made of slate, composition, plastic, metal, or even glass. Several companies now sell chalkboard paint, which contains small particles of ground slate. This material can be applied to any smooth, flat surface which will accept paint. Some of these paints also contain iron oxides that enable magnets to stick to the chalkboard surface. In this way, visual aids with small magnets taped to them can be stuck to the board and removed as needed during the lesson. This technique is a great time-saver for the instructor.

Chalkboards are not difficult to use, but the following guidelines will give best results:

- Make lettering large enough to be seen by the students in the last row.

- Make only one point at a time. A complete outline on the chalkboard tends to distract students and makes a logical presentation difficult. If writing has been prepositioned, it should be covered and then revealed one step at a time.

- Erase information which is not being used. A cluttered chalkboard with scattered unrelated material is confusing.

- Stand to one side to avoid hiding an item with the body.

- Use the upper part of the board. In many classrooms, students may not be able to see the lower half.

- Adjust window shades to remove glare.

Another device which can be used with the chalkboard is the template, of which there are two types: (1) a thin piece of cardboard cut into any desired shape such as a square, a triangle, or a circle, which can serve as a pattern to be traced, and (2) a piece of paper with a drawing on it with holes punched in the lines with a pencil point. When placed against the chalkboard and dusted with an eraser, a dotted outline of the drawing will appear on the chalkboard.

FLANNEL BOARDS. Flannel boards are pieces of colored felt or flannel on a stiff backing. The size, shape, and construction of the board depends on its intended use and on the preference of the user. Objects can be stuck to the board by using felt cutouts, felt-backed objects, or sandpaper-backed objects or pictures. Flannel boards, like magnetized chalkboards, allow for rapid display and removal of material. They are particularly useful where a "building block" approach would facilitate lesson development, as each part of a display can be added one at a time to form finally a complete concept.

BULLETIN BOARDS. Bulletin boards are so common in classrooms that a detailed description of their construction and use is not appropriate here. Mounting bulletin board displays with thumbtacks is not as fast and efficient as magnetic or flannel boards. Bulletin boards are better suited to materials and displays of a more permanent nature.

FLAT PICTURES. One resource available to all instructors is the flat picture. Photographs, paintings, drawings, cartoons, murals, and illustrations can be

- displayed on bulletin boards and in exhibits.

- given to students for individual study.

- projected on wall or screen using an opaque projector.

- copied on 35mm film and made into a slide.

- "lifted" from the paper and transferred to a transparency by a process known as "color lift."

Pictures are valuable to the instructor because they provide a common experience for students, visual details when necessary, and in the case of photographs, a realistic representation of objects, places, and persons. If visual recognition is critical, photographs are effective. Because pictures are inexpensive, widely available, and can be used in a variety of ways, instructors should actively search for suitable materials and keep an updated file.

To maximize the effectiveness of pictures, an instructor should insure that the size and distance do not distort the picture or detail required and that only critical elements are represented. If simplification or exaggeration of a component is important, illustrations or drawings should be considered.

CHARTS, DIAGRAMS, AND GRAPHS. The term chart includes any printed material which gives information in tabular form. There are several types of charts which can be used in presenting data: the pie chart, the flow chart, the organizational chart, and so forth. The type of chart selected for use depends to a large extent on the type of information the instructor wants to convey.

A graph is a symbolic drawing which shows relationships or makes comparisons. The most common types are the line graph and the bar graph. The selection of a graph for use in any given situation again depends upon the type of information the instructor wants to convey.

Charts, diagrams, and graphs can be used effectively to show relationships, chronological changes, distributions, components, and flow. They are easy to construct and can be produced in the same manner as pictures. In addition, they can be drawn on the chalkboard or duplicated. Care must be taken to display only a small amount of material and to make the diagram as simple but meaningful as possible.

MODELS, MOCK-UPS, AND CUTAWAYS. A model is a copy of a real object. It can be an enlargement, a reduction, or the same size as the original. The scale model represents an exact reproduction of the original, while simplified models do not represent reality in all details. Some models are solid and show only the outline of the object they portray, while others can be manipulated or operated. Still others, called cutaways, are built in sections and can be taken apart to reveal the internal structure. Whenever possible, the various parts should be labeled or colored to clarify relationships.

A mock-up is a three dimensional, specialized type of a working model, made from real or synthetic materials. It is used for study, training, or testing in place of the real object, which is too costly or too dangerous, or which is impossible to obtain. The mock-up may emphasize or highlight elements or components and eliminate nonessential elements for learning.

Production and equipment costs are limiting factors to consider in developing and using models, mock-ups, and cutaways. Depending on the nature of the representation, costs can vary from low to high. Scale replicas, for instance, are often very expensive. In general, if a two-dimensional representation will satisfy the instructor's requirement, it should be used.

SIMULATIONS. Most Air Force instructors are familiar with some type of simulator, such as a flight or navigation trainer. For our discussion, a simulator is usually any electromechanical device, which has the form, sound, and even the appearance of the actual equipment. Simulators, which allow the student to have "hands-on" experience with the equipment, are normally used when it would be safer, less costly, or would provide better instruction than the actual equipment. Simulators provide a realistic setting and permit a high degree of transfer of learning when the student switches to the actual equipment. The primary limiting factors are availability and cost.

OVERHEAD TRANSPARENCIES/PROJECTOR. An overhead transparency is usually made from acetate or plastic which has been prepared for use on an overhead projector. If hand drawn transparencies are needed, materials such as heavy-duty, clear plastic bags, document protectors, and reprocessed x-ray film can be used in place of commercially produced acetate. In addition, transparencies can be made from existing printed material by using a thermo process machine and special film.

The overhead projector has many advantages. The equipment can be placed at the front of the room, allowing the instructor to maintain eye contact with the students. The brilliant light source concentrated at a short distance makes it possible to use the projector in lighted areas. Transparencies are easily and economically produced ahead of time, or the instructor can write on a blank transparency as the lesson progresses, much like on a chalkboard. Students can write on their own transparencies and have the work considered by the whole class at once. Additional transparencies can be overlayed onto the original to show development or buildup of an event or display. Overlays can also be cut into various shapes and moved about in relation to the base transparency. Thus, relative motion can be displayed--a useful technique, for example, for displaying dial indications or the fitting together of several parts of a component. Finally, the overhead projector is simple to operate and requires little maintenance. Two disadvantages are that most projectors are bulky to handle and store and that the fan which cools the projector may be noisy.

As with any equipment placed in the front of the room, instructors should ensure that the projector does not obstruct the students' line of sight. The projector usually works better on a low stand, chair, or table. The projection angle should be adjusted to eliminate the image distortion called "keystoning," which results in a trapezoidal image instead of a rectangular one.

OPAQUE PROJECTOR. Vastly different from other instruments, the opaque projector reflects light from the surface of the picture or object onto a regular projection screen. The height of usable objects is limited to the space between the top of the lowered projection plate and the body of the projector--only a couple of inches. The area of the object or picture is limited to a ten-inch square.

The scope of materials available is practially limitless when instructors have the equipment and a satisfactory room darkening system available. A leaf, a piece of cloth, a portion of a student theme, a postage stamp, coins, typed material, and textbook illustrations are representative of the items that may be projected.

By using the opaque projector, a small cartoon, picture, or other illustration can be enlarged by projection onto wrapping paper, poster paper, or a chalkboard. This enlargement can then be traced and made into an effective chart or drawing.

Opaque projectors are especially valuable in enlarging diagrams and small charts for display purposes. Since the material projected requires no special preparation, the cost of production is very low.

Many of the limitations of the overhead projector are also true of the opaque projector, with the addition that the classroom must be completely darkened.

FILMSTRIPS/FILMSTRIP PROJECTORS. The filmstrip is a piece of 35mm film on which individual slides or frames appear in sequence. Some filmstrips are accompanied by a tape or disc that contains narration and a signaling device that indicates when to advance the filmstrip to the next frame. Depending on the type of projector, the film advances either manually or automatically.

The filmstrip provides the instructor with an organized presentation which is always the same. Individual frames may be held on the screen for as long as necessary for discussion. The equipment and filmstrips are inexpensive, small, lightweight, and easy to operate and store. If students are trained to use the equipment, they can progress at their own rate. A final advantage is that there are usually many filmstrips readily available from commercial sources as well as film libraries.

A significant disadvantage of filmstrips is that the sequence is fixed, thus limiting flexibility. They are not suitable when motion is required and lack the appeal of motion pictures and television. To make a homemade filmstrip, the pictures must be taken in exact sequence, requiring considerable advanced planning.

SLIDE PROJECTOR. One of the most popular and widely used instructional aids in the Air Force is the slide projector. Frequently a slide presentation is accompanied by an audio cassette recording, adding another dimension to the presentation. As with the filmstrip, this audio recording may contain a signaling device which, when used with a special recorder, will automatically advance the slides. Before using the equipment, the instructor should verify that the sound/slide program is synchronized.

The greatest advantage of the slide is ease in production and cost. With the use of a camera and appropriate 35mm film, an instructor can have a visual representation available for presentation in a matter of hours. These slides can be combined in any sequence with other "home" or commercial slides, thus providing a flexibility and versatility not found with filmstrips. Because they are not permanently arranged, slides can be easily updated, removed, or rearranged.

The sound/slide presentation is not suitable for use when we need visual representation of motion. Also, it is difficult to accommodate individual differences when used in a group setting. A darkened room is preferred unless the presentation is in a small area such as a learning center carrel.

MOTION PICTURES. The motion picture has been widely used for training and education throughout the Air Force. Most 16mm film is stored on reels, while 8mm film is stored on reels or self-contained cartridges.

Both can be either sound or silent and color or black and white. Projectors for reel type films vary greatly, particularly in the threading pattern. Newer projectors are self-threading. The 8mm cartridge and special projector have further simplified the use of motion pictures because an operator merely inserts the cartridge and removes it when the film is complete.

Motion pictures have many advantages. Events can be recorded as they happen and shown later as often as necessary. Previewing of film allows the instructor to select only appropriate portions necessary.

AUDIOTAPE RECORDINGS. The use of audiotapes--reel-to-reel and cassette--and tape recorders has become commonplace equipment in most homes and schools. Lectures by specialists and experts can be recorded for widespread distribution or for later playing when the lecturer is not available. Tape recordings are inexpensive and easily stored. At some schools all lecture presentations are recorded on cassettes and stored in the learning center for use by faculty and students. Both reel-to-reel and cassettes can be erased and used over again when the existing recording is obsolete. Like videotape recorders, audiotape recorders can be used as diagnostic or evaluation instruments in improving speech. Recorders are easy to operate both in the record and playback mode. Cassette recording can also be used in conjunction with slides (see the slide tape discussion).

The primary disadvantage of the tape recording is that the sequence is fixed. It is possible to skip over parts of presentations, but the instructor must take care to note the place on the tape either with a piece of paper or a counter. Periodic cleaning of tape recorders is necessary to maintain quality of recording.

Audiotape Recorder (Compressed Speech). In recent years an additional use for audiotapes has been found. Most students can listen and comprehend material much faster than a person can talk. However, until recently there was no way audiotape speed could be increased significantly without the speaker's pitch becoming distorted and unintelligible (chipmunk sound). Machines are now available which allow the rate of presentation to be increased by a factor of 2.5 without distorting the pitch. This machine is known as a speech compressor.

The speech compressor has many advantages, the primary one being the reduction of listening time. Experience has shown that a student can listen to familiar, nontechnical material at a much faster rate than for material which is unfamiliar or technical. Compressed tapes are especially effective for review. The regular cassette tape the compressor uses can be played on any ordinary cassette playback unit. Although speech compressors are presently expensive, the cost should decrease as the method becomes better known. If listening time is not a factor, the purchase of a speech compressor may not be appropriate.

If it is important that the student be able to control the rate of listening, the speech compressor itself must be used for listening. A prerecorded compressed tape may be too fast or too slow for the listener and, therefore, lose some of its advantages. To date there is no known method of training students to increase their listening rate as can be done with reading.

TELEVISION. The use of television in training and education continues to receive increasing emphasis in the Air Force. Televised material is usually presented in two forms: either "live" or via videotape recordings (reel-to-reel tape or cassettes) through a closed circuit system. A simple, closed circuit system requires a camera, monitors, and an interconnecting network. However, many systems are more elaborate. Through their use, material can be distributed to large numbers of students and locations at the same time. The capability of presenting audiovisual material simultaneously at several locations is unique to television.

Another advantage of TV is the versatility of videotape. Events can be seen as they happen or placed on videotape for later viewing. Specialists in any area can be videotaped and presented "live" to the student. If a teacher feels it is necessary that all students receive the same material presented the same way, television will allow this standardization. However, we may not wish to use TV exclusively in place of live presentations. Students often react more positively to live lectures, with supporting visual support, than a lecture seen on TV. Using videotape recordings as support during lectures and other live presentations is also very effective.

With its record and playback capability, television has proven to be as effective for evaluation in a variety of training situations as for teaching. Recordings of many kinds of student activities can be played back for the students to evaluate their performance either individually or collectively. This technique, often called self-confrontation, has applications in many training areas. Anyone who wishes to evaluate performance (as a teacher, a trainee, or an athlete, for instance) will find TV invaluable.

Some of the problems with using TV for educational purposes are caused by the habits most students have developed from watching commercial programs. First, students are accustomed to watching professional productions with expensive and elaborate sets, proper lighting and editing, and highly paid talent. Locally produced educational TV normally cannot equal this production quality. As a result, students may have a tendency to spend time evaluating production quality, reducing their attention to content and adversely affecting learning. To counteract this, instructors should work closely with the local production studio to ensure that the program is as "professional" as time, money, and effort will allow. Instructors should be aware that there are few shortcuts to producing a good TV presentation.

A second problem arising from the students' prior experience with commercial TV is the tendency for them to be inattentive and passive during the presentation. Very few TV programs which students watch at home require any concentration or study. Many students expect to be entertained rather than learn from TV.

Another factor an instructor must consider before selecting TV as the medium to present material is that the seeing and hearing rates of students are fixed. This does not provide well for individual differences in learning rates. Also, great care must be taken to reduce the time the "talking head" is seen on the screen. Unless standardization of material is absolutely necessary, a teacher should refrain from just talking before a TV camera. Too often this has happened in past programming and has been found to be ineffective. An imaginative TV production crew can help "translate" a lecture into video terms.

Finally, there is the issue of color vs black-and-white TV presentations. Practically speaking, color is not necessary unless the material presented requires its use, e.g., a chemical reaction in which a color change is important to understanding the process. However, today's average TV viewer, who has been constantly exposed to color productions, considers black and white "dated" and, therefore, not worth watching.

USE OF MEDIA IN INDIVIDUALIZED INSTRUCTION

Our discussion of instructional aids has so far centered around their use in classroom settings. No treatment of the subject would, however, be complete without at least a brief look at technology as it applies on a more individualized basis. Certainly, media applications go much further than will be covered here. However, our limited look at programmed instruction, learning centers, and basic computer capabilities represent typical media uses encountered in Air Force instructional environments.

PROGRAMMED INSTRUCTION

After instructional material has been programmed (see AFP 50-58, Volume VI), the programmer must present it to the student by means of some type of "holder." At this point the teaching machine and the textbook come into the picture.

But the programmed text or teaching machine is limited primarily to teaching knowledge level material. Teaching skills or performance may require the use of actual job equipment or a simulator as the "teaching machine." It is important that the instruction take place in an environment which duplicates the operational environment as closely as possible.

Programmed Textbooks

Many authorities are convinced that a programmed textbook is sufficient for most programmed instruction. Programmed texts have been developed for a wide variety of subjects, including: grammar, spelling, composition, almost every area of mathematics, electricity/electronics, foreign languages, accounting, management, computers and data processing, and medicine. Refer to AFP 50-58, Volume VI, for more information on the various types of programmed texts.

Teaching Machines

Within recent years technology has invaded the classroom. Many electronic and mechanical devices are being mass produced and sold on the basis that they will allow students to learn "more and faster." One commercial organization guarantees not only the level of learning its students will achieve by taking its courses, but specifies the amount of time it will take to reach that level. The method of instruction involves programmed instruction presented by teaching machines.

A teaching machine is an electronic or mechanical device that presents instructional material to students on an individual basis. Students have their own machines and receive instruction as fast as they can absorb it. Assuming, of course, that the student needs the instruction to begin with, machines provide truly student-centered instruction, which is both individualized and self-paced.

Teaching machines are produced with great differences in complexity and special features; however, they all represent some form of tutorial teaching. They present each student with problems, exercises, questions, and answers. The difference between teaching machines and most other instructional methods is that teaching machines provide immediate feedback to students. They can correct errors immediately because they make students aware of their progress during each phase of instruction. Thus, teaching machines differ from other media in three ways:

1. Students must respond continously and actively, providing explicit practice and testing of each step of what is to be learned.

2. Students know as soon as possible whether responses are correct, so that errors can be corrected.

3. Students proceed on an individual basis at their own rate—faster students advancing through an instructional sequence very rapidly, slower students being tutored as slowly as necessary, with almost infinite patience to meet their special needs.

The nature of teaching machines and programmed instruction provides a channeling of student activity into a relatively narrow chain of experiences. Students have available only a small portion of the lesson at any one time and cannot advance or regress unless that action is programmed into the lesson (or machine).

In presenting a program, a teaching machine provides immediate feedback on all student responses. Unlike a programmed text, students cannot see the feedback before responding. Students are therefore forced to subject themselves to all the conditioning designed into the programmed lesson.

Teaching machines usually maintain a record of student performance. This record can be used to analyze progress and serve as a basis for determining future studies. Collectively, a group of student records may be used to determine what curriculum changes may be required.

Many feel that the teaching machine provides a constant motivational factor to the student. The student is challenged to "beat the machine." Others claim that this fascination wears off after a time, and once it does, the machine is no more effective than a programmed text.

LEARNING CENTERS

A learning center is a facility containing a number of study carrels equipped for individual instruction. A resource library where instructional packages are readily available is an integral part of a learning center.

The instruction is often self-paced, although not necessarily so. Furthermore, a learning center takes full advantage of modern technology by providing students the opportunity to receive instruction closely tailored to their needs. Instead of a teacher, some mechanical or electrical device delivers the instruction. By being relieved of some traditional tasks, the teacher has more time to monitor student progress and to manage curriculum. Borrowing from computer jargon, the equipment is referred to as "hardware"; the films, slides, and tapes that contain the actual lessons are referred to as "software."

The physical configuration of a learning center is quite different from the traditional classroom. Each student has space and equipment that enables lessons to be delivered on a one-to-one basis. A study carrel provides the physical isolation that can aid in maintaining attention and concentration.

The learning center provides instruction with equipment that the students control in the privacy of their own carrels. Students then perceive the instruction as intended for themselves alone even though others may see the same lesson. Viewing television lessons on individual monitors located in each carrel also gives the illusion of individual instruction. By perceiving the instruction as individual in nature, students generally improve their acceptance of the instruction and improve their attitude toward the lesson.

Learning center instruction is also self-paced in most cases, even if the instruction is not programmed. Students have the option of stopping and going back. Through the use of such media as super 8mm sound film or videotape cassettes, planners can subdivide a broad area and present small, easy to digest segments referred to as "single concepts." Students can view any or all of the media as they or the instructor decide. The decision as to which media to view is based on student background, future job requirements, aptitude for the subject, and capacity to learn.

COMPUTERS IN EDUCATION

Most people are aware of the computer's application in business and industry. The functions of accounting, billing, maintaining inventories, and retrieval of personal data are widely accepted. However, the adoption of the computer for educational purposes is a relatively recent development. In general, the computer we use for management and scientific functions can also be used for education.

Time Sharing Systems

Most installations for computerized instruction use a time-sharing computer arrangement. A number of individual terminals are connected into a single, central computer (Figure 19-1). The central computer may even have some other primary function other than instruction. For instance a bank could use the computer for its accounting needs. The bank could then lease the time it does not use to a school for instructional purposes, thereby providing an educational service and helping to meet the cost of the computer installation.

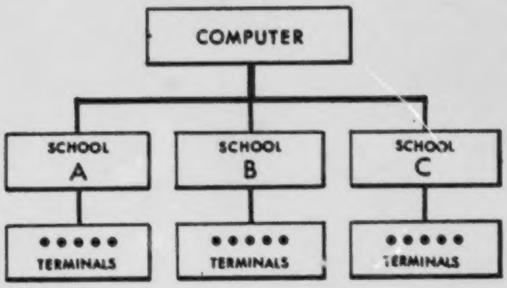

Figure 19-1. Terminal Tie-In to Central Computer

The individual terminals take several forms. First, students may use a standard teletype unit and communicate with the computer in typewritten messages. Students type communications, and the computer controls the printing mechanism by a series of electronic signals. The teletype unit prints the computer's instruction on a roll of teletype paper, as it does the student's replies. This system has the advantage of providing a printed or "hard copy" of the instruction that has taken place, as well as the student's responses. However, the terminal produces the printed instructional material slower than the normal reading rate of most adults. For them, this means that the instruction is slowed down, but only for the period required to print the information.

The second device is the video terminal. Students view printed instruction on the face of a cathode-ray tube (CRT). They respond through a standard keyboard, and the responses appear on the CRT. There is no hard copy of the lesson. Depending upon the type of video terminal and auxiliary equipment used, the rate at which the print appears on the screen will vary from that of the teletype terminal to far beyond most human reading abilities. The noise level of the teletype is high, while on the video noise level is negligible.

Computer Assisted Instruction (CAI)

The predominant methodology used in CAI is Programmed Instruction, using a branching technique. Superficially, the job the computer does is about the same as that of a programmed textbook. However, the inherent capabilities of a computer enable the programmer to develop branching systems far beyond the capabilities of any textbook. The instructional programmer can take more variables into account and provide programs that will meet the needs of a broader range of students. Conventional textbook branching techniques usually require the student to respond to multiple-choice questions. The student follows a branch of the program according to his or her answer choice. Computer queries can be left open ended and the computer can be programmed to deal with a large number of possible replies and branching possibilities. CAI also has a speed advantage because the student is not required to leaf back and forth through a text to follow the program. The computer makes the branching choice and presents the required information almost instantaneously. Thus, the computer adds power to the concept of programmed instruction.

Another popular CAI method is following a problem solving process. This method is particularly applicable in teaching and diagnosis of malfunctions of any system. Therefore, this method is used to teach medical diagnosis, management systems analysis, and analysis of the malfunctions of electronic and mechanical systems. CAI is also applicable to the simulation of potentially destructive or expensive activities such as war games.

Computer Managed Instruction (CMI)

Using a computer only for CAI does not capitalize on its greatest potential. The power of a computer lies in the speed at which it can process data, its ability to perform complex tasks, and its capacity to store and retrieve files of data. CMI is the concept that brings the full capability of the electronic computer into the educational situation.

First of all, the computer can help administer students, the curriculum, staff, and facilities, and, at the same time, much of the day-to-day management. The computer can devise schedules, test students, and assign them to study appropriate lessons. The computer can present instructional material, follow student progress, and make decisions on the particular instructional sequence to present. It can combine any number of criteria to assist in making instructional decisions.

Interested instructors and managers can receive periodic reports on any area of interest or order the computer to retrieve and analyze data at will. Decisions in all departments of a school can be made based on current, accurate information. Basically, then, the computer can eliminate many of the time consuming tasks, handle routine matters, and provide instructors and administrators with tools and controls previously unavailable.

In operation the instructional program presents students with information about a particular system. Students make attempts at analyzing situations, while getting more and more definitive information from the computer and as a result of their own efforts. The computer may give additional information as a hint to help out or the student may have the option of asking for additional information. The computer effectively critiques all of the student's efforts, providing immediate feedback.

Just as in other applications, the computer in education is just as effective as it is programmed to be. A well designed instructional program can be extremely effective, whereas a poorly designed program can actually be detrimental to the achievement of an educational objective.

STUDENT/INSTRUCTOR ROLES IN MEDIATED INSTRUCTION

The Student

Traditionally in the learning process, students are predominately passive during the initial intake of information. The active period is limited to taking notes while the instructor lectures. After class, students develop their own system of studying, but even homework has usually not been exploited to give the student proper, corrective feedback. In fact, about the only planned "activity" in which students normally engage has been testing. Thus, the important need for feedback on a student's progress usually has come too late in the form of "pass" or "fail" grades.

Creative curriculum design and well-planned support facilities can provide students with an active, interesting, and rewarding learning experience. Students can receive instruction tailored to their needs, be active during all phases of instruction, and receive immediate feedback on the progress. Difficult learning tasks can be elaborated upon and reviewed, while simple ones can be learned quickly and students can move on at their own pace.

However, when taken away from the traditional classroom setting, most students miss personal contact with the instructor, even though it may be no more than being in the same room and listening to the instructor. Students also lament the loss of contact because of no opportunity to ask questions or discuss material. Even a small amount of personal contact with the teacher seems to satisfy this need for personal contact. Therefore, occasional individual counseling sessions should be planned in the curriculum as well as scheduled periods for group discussion.

The Instructor

The role of the instructor becomes more rather than less complicated in mediated instruction. Instructors must still teach in this environment, although they may not occupy center stage as often. One-on-one teaching and problem solving become the rule. We teach individuals rather than sometimes anonymous "classes." Constant, often intense, interpersonal relationships may demand a level of counseling skills higher than that for traditional large group instruction. We will probably have to have an even stronger knowledge of our subject than usual because we will be available for questions and problems. The individualized nature of mediated instruction increases the opportunities for more personalized teaching and learning. The learning packages which deliver the bulk of instruction are just the beginning, not the end, of mediated instruction.

The individual student, rather than the body of subject matter, must remain the focus of attention. Those of us who teach courses with heavy media usage must remember that the media are generally used to free us from repetitive, low-level instructional tasks. But media cannot replace us completely. Media cannot interpret itself to the student who is having trouble with vocabulary. Media are not able to come up with an unprogrammed example when a student is still having trouble with a new concept. Even the most sophisticated media package is not able to express genuine human interest and concern over the problems of a student. If we do not have anything left to teach or assistance to render after the media does its job, we probably were not needed as teachers in the first place.

Many of us would prefer to keep away from these mediated learning experiences. Students do not come to us when things are going well; they need us only when they have problems. Problem solving for instructors, like all forms of problem solving, is difficult and demanding. Simple, stock answers often do not work. There is a sense of security in teaching large groups that we lose when we go to one-on-one instruction. We cannot give general answers to specific questions. We cannot deal impersonally with personal problems. We may have to learn and use a whole new set of skills in addition to those we have as large group instructors. Students who need help in one-on-one instruction need much more than information givers. They need real teachers who have the technical knowledge and counseling skills to help them solve their very real, personal instructional problems.

Instructors who teach laboratory classes know how much more difficult their job is compared to those who just lecture. We can lecture on a subject with no more knowledge than the script of our lecture. But when we open the lecture to questions, conduct a discussion, or most demanding of all, go one-on-one with a student who needs help with a mediated learning experience--then we need the real experts. No instructors are more called on to show their subject matter expertise. There is no way to hide a lack of instructor expertise in one-on-one teaching in support of mediated instruction.

Instructors who teach in heavily mediated courses often need more skill in interpreting and testing objectives than do instructors who teach large groups. Mediated instruction is generally characterized by precisely written objectives and test items which we have finely tuned to measure them. Because of this precision, instructors with a heavily mediated course may be called upon regularly to interpret objectives and test items. Those instructors who actually develop media packages must become especially skillful with writing objectives and test items as well as with the special skills demanded to produce the media. Those instructors who administer but do not create mediated instruction need especially good curriculum development skills so that they can give high quality feedback to those who must revise and improve the course.

Instructors in mediated learning experiences have as many demands placed on them as in any other difficult teaching situation. In-depth subject matter expertise and expert counseling skills are just the beginning. We have to deal with a different role model--one that requires us to be managers of learning and problem solvers rather than just givers of information. It is a tough role but one which is essential if we are to provide the most efficient and effective instruction to our Air Force students.

SUMMARY

Instructional System Development is a systematic process for planning and conducting instruction. Analysis, design, development, and evaluation are carefully considered in achieving instructional goals. Audiovisual aids can contribute greatly to instructional effectiveness. The test suggests a variety of methods and the considerations of the instructor in electing to use them.

Both advantages and disadvantages must be considered in applying communications media to education, especially educational television, programmed instruction, and teaching machines. Learning centers combine media at study carrels--for individual instruction. Learning may also be aided by computers--through sophisticated programmed instruction, computer managed instruction, and other applications.

SECTION D

EVALUATION

Chapter	Title	Page
20	Introduction to Evaluation	20-1
21	Constructing and Administering Classroom Tests	21-1
22	Measuring Learning Outcomes	22-1
23	Evaluating by Rating	23-1
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25	Norm-Referenced Analysis	25-1
26	Using Feedback in the Classroom	26-1

Section D introduces the two major approaches to evaluation: Norm Referenced (comparing individual student performance to that of the group) and Criterion Referenced (comparing individual student performance to a predetermined objective or standard). The section also introduces several ways to measure student performance and discusses the human element involved in providing meaningful feedback to students.

Chapter 20

INTRODUCTION TO EVALUATION

Introduction

In some way or another, as instructors, we continually evaluate our students. The evaluation may be part of a formal testing program, or it may be quite informal. It may be as elaborate as a simulation of a real-life problem or situation, or as simple as our questioning a single student. We may evaluate just to see how students are progressing, or we may need to give grades and make pass/fail decisions.

Not all instructors may be involved in actually writing and preparing tests, but they usually give tests and certainly ought to critique them. As instructors, we should be thoroughly familiar with the test items, exercises, and evaluation procedures that will be used to determine whether our students have been successful.

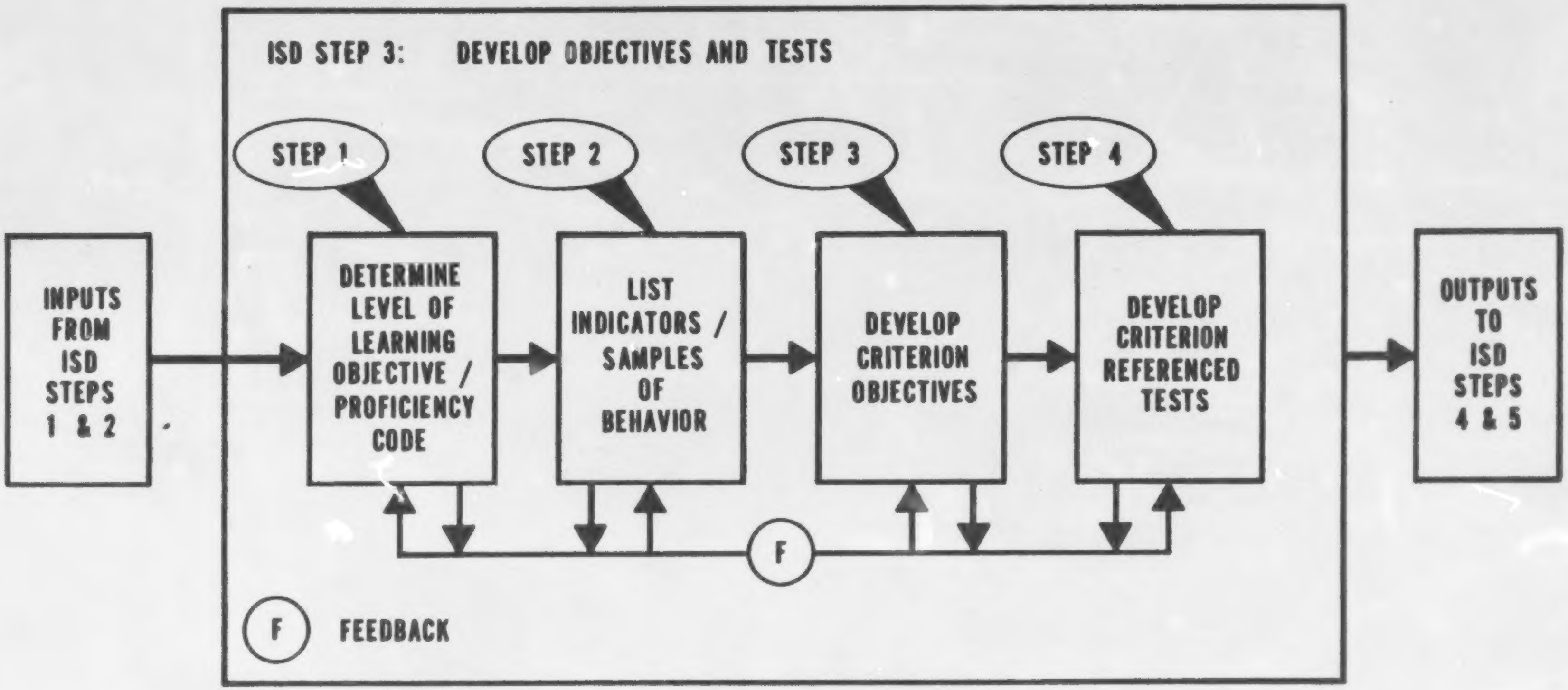
Figure 20-1 again illustrates the 4-step process for writing student-centered objectives and tests. This process, first introduced in Chapter 3, Writing Student-Centered Objectives, has been the theme of much of this manual. This chapter on evaluation and the four chapters that follow require an understanding of material presented in earlier chapters. Specifically:

Chapter	Title
3	Writing Student-Centered Objectives
4	The Level of Learning Lesson Planning Process
5	Writing Criterion Objectives
7	Developing Knowledge Level Lessons
8	Developing Comprehension Level Lessons
9	Developing Higher Level Lessons
10	Writing and Measuring Affective Objectives

The 4-step process includes all the steps necessary to plan and prepare student-centered objectives and tests. Each step affects the others. Level-of-learning objectives (Step 1) are of little value in planning if we can't write them as behavioral outcomes (Step 2). These behavioral outcomes, in turn, receive their focus from Step 1, but further provide the basis for precise criterion objectives (Step 3). Test items (Step 4) flow naturally from the criterion objective because we have spelled out all of the conditions, behaviors, and standards. A change in any step has a ripple effect on all others. Because all of the steps in this process are interdependent, we never finish writing a general or specific objective until we write test items to measure it.

We have a need, then, to master skills of constructing and analyzing tests and other measurement tools. While not all instructors may require the same depth of understanding as the evaluation specialists, we all need to have basic evaluation skills to do our best job in the classroom. We teach differently when we understand the way our students are to be evaluated. We tend to teach the learning outcomes more directly when we understand the way the outcome will be measured. Whether we have the opportunity to write test items or not, we must understand evaluation terms, principles, and practices. Our students expect us to prepare them for evaluation. It is our obligation to know as much about their evaluation system as we can to teach better, counsel more effectively, and be more responsive as Air Force instructors. In addition, if we do not construct our own tests, we are better able to provide feedback on behalf of our students to evaluation specialists.

FIGURE 20-1, FOUR STEP PROCESS FOR WRITING STUDENT - CENTERED OBJECTIVES AND TESTS


ISD STEP 3: DEVELOP OBJECTIVES AND TESTS
INPUTS FROM ISD STEPS 1 & 2
STEP 1
DETERMINE LEVEL OF LEARNING OBJECTIVE / PROFICIENCY CODE
STEP 2
LIST INDICATORS / SAMPLES OF BEHAVIOR
STEP 3
DEVELOP CRITERION OBJECTIVES
STEP 4
DEVELOP CRITERION REFERENCED TESTS
OUTPUTS TO ISD STEPS 4 & 5
F
F FEEDBACK

Nature of Evaluation

Evaluation is an important part of the learning process. In educational evaluation, we define, observe, and measure or judge learned behavior. Once instruction begins, we need to evaluate continually to determine both what and how well students learn. Only with this information can we intelligently plan our instruction.

Educational evaluation is the systematic process of judging how well individuals, procedures, or programs have met educational objectives. We can evaluate learned behavior we can see, hear, or otherwise sense. In such observations, we can include only a sample of single instance of student behavior. To be reliable and effective, the sample evaluated must represent the student's overall behavior in the area measured.

As instructors we see students differently because of differences in our intelligence, learning ability, aptitudes, attitudes, job knowledge, and ability to verbalize. We have to try to control the effect of these differences when establishing and operating an evaluation program. Failure to recognize our differences as instructors can result in unfair and inaccurate measurements of student achievement.

We can often observe the student's progress toward course objectives in class discussions, interviews, term papers, laboratory exercises, special projects, and tests. It is important that we weigh all such observations to determine their real value to our overall evaluation program. Our subjective judgment often influences informal day-to-day evaluations and makes them invalid. We may tend to remember only the student responses that indicate progress toward learning goals and to forget unfavorable responses. To avoid this pitfall, we need to follow a systematic approach in evaluating student achievement, such as that pictured in Figure 20-1. An evaluation program we plan in advance is less subject to the personal bias of individual instructors. Planned systems for evaluation will measure what should have been taught rather than what instructors may have decided to teach on their own.

We use data from evaluation programs in two ways: (1) comparing students to stated objectives and (2) comparing students to each other. If our goal is to compare the achievement of our students to specific objectives, we use criterion-referenced (or objective-referenced) testing programs and analysis procedures. Air Force Instructional System Development (ISD) encourages criterion referenced testing and analysis. We speak of norm-referenced procedures when we compare the performance of individual students to the group. This practice usually leads to rank ordering or letter grading of students.

Chapters 21 and 23 describe proper techniques for constructing paper and pencil tests and performance rating instruments. We use similar construction principles for both norm-referenced and criterion-referenced evaluation programs, but analyses techniques are quite different. Separate chapters will deal with criterion-referenced test analyses procedures (Chapter 23) and norm-referenced procedures (Chapter 24). Measurement instruments constructed for use in one system may be used in the other, but normally we do not use a single set of instruments for both criterion and norm-referenced analysis.

Characteristics of Evaluation

The instruments we use to measure achievement must be reliable, valid, objective, comprehensive, and capable of differentiating. Even when we base our evaluation on judgment alone, we must use these basic characteristics as guidelines.

However, few Air Force tests are completely valid or invalid, or completely reliable or unreliable. Any given test or rating scale may possess each of the characteristics in varying degrees.

Reliability. A reliable measuring instrument is one that yields consistent results. If a tape measure provides identical measurements each time we use it to measure a certain dimension, we consider it a reliable measuring instrument. An unreliable instrument will not yield consistent results. An altimeter with improperly adjusted moving parts, a steel tape that expands and contracts with temperature changes, or cloth tapes affected by humidity will not yield reliable measurements.

No instrument is completely reliable, but some instruments are more reliable than others. For example, we can determine, to some extent, the reliability of a thermometer by taking several readings of the temperature of a fluid that is maintained at a constant temperature. Discounting our own reading errors, we ought to suspect the thermometer's reliability if we don't get consistent readings.

Reliability means the same whether we apply the term to balances, thermometers, and altimeters or to educational tests and ratings. It refers only to the consistency of results obtained from a given instrument. However, to measure the reliability of a rating scale or examination is a more complex problem than to measure the reliability of a mechanical device. If we use the same calipers at different times to measure the bore of the same cylinder, our results should be almost identical each time because the size of the cylinder does not change appreciably between measurements. However, change often occurs during educational evaluation. Knowledge, understanding, and skills do not remain constant. For example, in educational testing, students change between two attempts on the same test because they gain new knowledge and understanding.

Reliability of a measuring instrument is equally important in both criterion-referenced and norm-referenced testing. The measures must be consistent whether students are to be judged against an absolute standard or to be compared with one another.

Validity. A measuring instrument is valid when it measures exactly what it is supposed to measure. Mechanics who use a micrometer to measure the diameter of a bearing must be sure that the contacting surfaces of the bearing and the micrometer are free from grease and dirt. Otherwise, they will measure the coating in addition to the diameter of the bearing. The measurements will be invalid, of course.

Although a measuring instrument may be highly reliable, it does not necessarily follow that it is valid. The instrument with maximum consistency (high reliability) may not measure what we intend it to measure. In other words, an instrument may simultaneously have a high reliability and a low validity. For example, merchants who use false scales may obtain reliable measurements but invalid results (at least from the customer's point of view).

A test used in educational measurement follows the same principles of validity. If we want an examination to measure the ability of students to apply a skill, it must measure application and not the ability to recall facts. If we design an examination to measure our students' understanding of the operation of a four-cycle internal combustion engine, we should not, at the same time, measure their ability to read printed matter. If the reading level is too high for students, then we are measuring reading skill on the exam, not understanding of the subject matter.

We can determine the validity of a measuring instrument by comparing it with some criterion or standard that is relevant to the test, test item, or rated trait. For example, when the purpose of the test is to identify or measure a special aptitude, the student's subsequent performance in that area is the most relevant criterion for test validity. If we design a written test to measure aptitude for piloting an airplane, we can check the validity of the test only by comparing the test results with the demonstrated ability to fly an airplane (Figure 20-2). If students who score high on the pilot selection test later prove to be excellent pilots and if those who score low on the test are unsatisfactory pilots, the test has a high degree of "predictive validity."

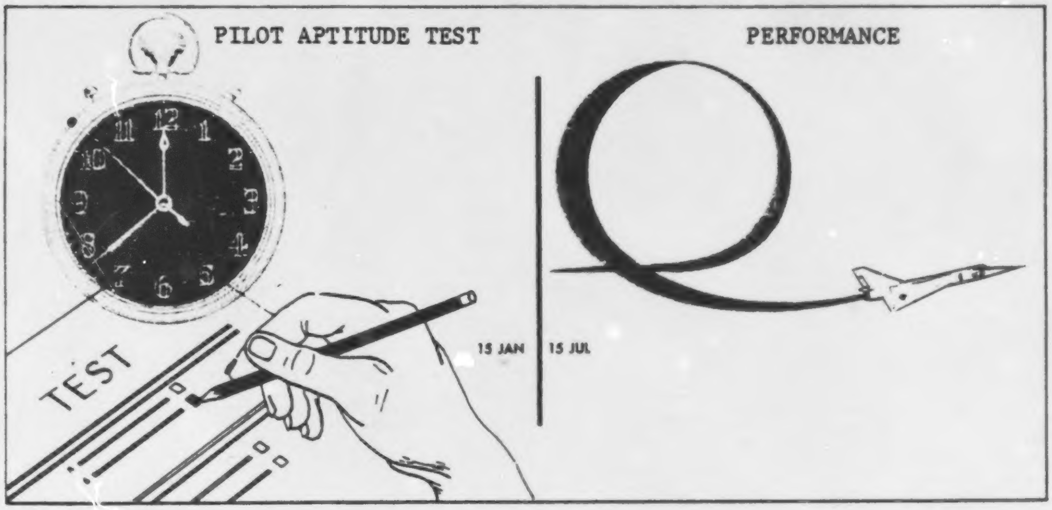


Figure 20-2 Validity of a Test

Sometimes, we determine the validity of a measuring instrument through comparisons of results with later performance on the job. The real objectives of Air Force instruction, after all, are usually aimed at improving job performance. If the objectives are relevant to the job, then job performance may be the criterion for determining the validity of tests used in a course. We can either test our students after they graduate, or we can verify our test by giving them to experts in the same field.

Sometimes, our goal in Air Force schools is not to improve performance at a specific job but rather to raise the student's overall level of ability. Most advanced courses in both military and civilian non-technical schools represent this type of curriculum. Most of the measuring instruments used in these schools measure achievement that cannot be related to specific job performance. Consequently, it is hard to determine validity. In these instances, we can consider classroom tests as valid if they measure our objectives. When we state objectives in terms of specific abilities, the test should require students to demonstrate these abilities. When we state objectives in terms of understanding, application, and factual knowledge, the test should have students demonstrate behavior we are willing to accept as evidence of their achievement.

Several competent instructors may provide a rough estimate of the validity of a classroom test. To estimate validity, they read the test critically and consider its content in relation to stated objectives. Following this analysis, they modify or eliminate items that do not pertain directly to the objectives of the course.

Since it is related to the purpose of the course, validity is the most important feature of any measurement. The instructor must carefully consider whether the test or rating scale measures what it is supposed to measure. Well-written criterion objectives will provide the detail necessary for valid test items. We can analyze the data these items yield through either criterion-referenced (absolute) or norm-referenced (relative) techniques.

Objectivity. The personal bias of the rater or test scorer should not affect the score. For example, a supervisor in a civil engineering squadron must select three workers for a team to complete an emergency construction job. Six available people are called into the office for a conference and an evaluation. We can compare their weight, height, age, and other physical characteristics. We can make these comparisons objectively, but they do not tell us enough; we also need to know how each would react under stress. We need to review their emotional stability, their attitude toward work, their loyalty to the squadron, and how skilled they are. In making these evaluations, the supervisor tries to be objective, but personal bias will undoubtedly influence the evaluation. Thus, part of the evaluation lacks objectivity, because the judgments of personal qualities are subjective.

In classroom measurement, essay tests tend to be subjective because our opinion of a student's writing skill, handwriting, personal qualities, or other factors may influence the grade we assign to the test. The grades we give on an essay test may vary from day to day, or they may vary from one scorer to another. In both cases, personal bias tends to influence the scores.

Comprehensiveness. A measuring instrument must sample liberally whatever is being measured. Suppose, for example, the owners of grain elevators want to evaluate carloads of wheat. If they analyze a bushel of wheat from the top of each carload, they will have a poor test--one that is not sufficiently comprehensive. A judgment based on this measurement cannot be safely applied to entire carloads; the wheat at the bottom of the car may be infested with insects. But if the owners take 50 test tubes of the wheat from different positions in the carload, they may analyze less than a bushel of wheat, but they will have a much more comprehensive evaluation of the contents of the car.

Similarly, in classroom measurement, a test or rating must sample liberally the stated objectives of instruction. An exam should not test one area of the curriculum in depth at the expense of other areas which need evaluation. At best, however, any evaluation is only a sample of the entire course. Just as the owner of the grain elevator must select samples of wheat from different positions in the car, so we must be sure that we include a representative and comprehensive sampling of course objectives. In the ideal case, of course, we would measure all course objectives. Usually, though, we have a lot of material but only limited testing time available.

Sometimes we write too many noncritical objectives rather than focusing on those which are critical. If we try to limit our objectives to those important enough to measure, we can construct an evaluation program which tests a much larger sample of our objectives. In any case, we must deliberately take comprehensive samples which test as many objectives as possible.

Differentiation

We must construct measuring instruments that detect significant differences. Suppose, for example, that a machinist wishes to measure bearings that are slightly graduated in size. If we use a ruler to measure the diameters of the bearings, the differences between them may not be obvious. But if we take measurements with a micrometer, we can easily differentiate between the diameters of the first and second bearing, the second and third bearing, and so on up the scale. Similarly, we can design classroom tests to differentiate between our students.

Norm-referenced Differentiation. Using this example, one goal the machinist might have is to arrange the bearings from smallest to largest. In a norm-referenced evaluation program, a test or rating must measure small, and sometimes not especially significant, differences in achievement. We need to be able to use the data from evaluation to make a rank order or give a letter grade to students. Our goal is to be able to analyze and compare individual performance with group performance (or the norm). Often we make this comparison without caring whether or not the individual or the group has actually met the stated objectives.

When we construct a test or rating scale to differentiate achievement for norm-referenced analysis, we look for three features: (1) a wide range of scores; (2) all levels of difficulty; and (3) the distinction between students who are generally low and those who are generally high in achieving the objectives.

Criterion Referenced Differentiation. A more significant way our machinist might have used the measurement of the bearings is to compare each bearing to a standard to find out whether it meets established tolerances. The question, then, is "Does each of the items being measured meet the tolerances?" In the classroom we ask, "Has each student met the stated objective?" This approach to testing distinguishes criterion-referenced testing from most traditional testing programs. The primary function of differentiation in criterion-referenced testing is to make a clear distinction between those of our students who have mastered an objective and those who have not. Rank ordering or letter grading is of secondary importance.

Determining Means of Measurement

An effective measuring instrument must be based on all five of the characteristics--reliability, validity, objectivity, comprehensiveness, and differentiation. In determining methods of measurement, we must select the instruments that represent the most satisfactory balance of these essential qualities. The use of the instrument depends upon the unique circumstances surrounding the school, the instructor, and the students.

Reasons for Evaluation

Why are we testing? To improve instruction? To pinpoint student deficiencies? To identify specific degrees of skill achievement? To predict success on a future job? Depending on the answer we must analyze carefully the means we need to use to reach these goals. If we are evaluating solely to assign grades, measuring instruments will be much simpler. In the Air Force our primary reason for evaluation is usually to determine whether students have achieved our stated objectives.

Nature of Required Behavior

Can the student's behavior be realistically represented by word or pictures on a paper and pencil test? Or must students perform in real situations for the evaluation to be valid? Do students need an active or a passive knowledge of the material in our course? Will they respond in much the same form as we taught them or do we want them to translate or synthesize the material in some way? We may need to modify our curriculum and course materials to get the kind of evaluation that we really need. Physical performance and essay testing will probably require more time to accomplish, but we must plan for them if they are necessary.

Relative Importance of the Behavior

Does the life of some person or expensive piece of equipment depend on the student's performing correctly the first time on the job? In some cases (in medical or maintenance fields, for instance), students must perform at least the critical elements of the required skill for evaluation. Less important or less critical skills may be evaluated on a pencil and paper test.

Time and Facilities Available

Are the students required to perform the skill during the learning process? If so, we may use evaluation as an extension of the learning activity. If students are not actually required to perform a skill, it is obviously less critical and we can save time and space. In either case, the facilities available for evaluation are an essential factor. Time may also influence the decision. For example, how much time must we set aside for evaluation by each means, and do we have the time available?

Availability of Qualified Faculty

When choosing the best means to evaluate, we must consider the availability of a qualified faculty. Can they judge performance of students in terms of a rating? Can they judge responses of students in terms of grading specific instruments, such as essay and other supply type tests?

Only when these factors have at least been considered and weighed can the instructor choose the best means for evaluating students. Quite likely, no one means will accomplish all purposes. Under such circumstances, the instructor must either use a variety of measuring instruments or compromise by accepting less from the evaluation program than the ideal.

Summary

Educational evaluation is the systematic process of judging how well individuals, procedures, or programs have met educational objectives. Criterion-referenced testing is concerned with determining learning effectiveness and is, therefore, inseparable from the learning process itself. The process begins with a clear definition of objectives, regardless of the means of evaluation. In practice, testing and performance ratings are the almost exclusive means used to estimate how well students achieve objectives. A secondary purpose of evaluation data may be to make a rank order to give letter grades to students as some measure of general achievement through norm-referenced testing and analysis.

The evaluation process must be systematic and continual; occasional or disorganized observations usually lack comprehensiveness, validity, and reliability. To be usable, conclusions must be presented in a form that can be properly interpreted by the school, the instructor, and the student. Whatever means we use, the test should possess, to the maximum possible degree, the five characteristics of evaluation: reliability--it yields consistent results; validity--it measures exactly what it is supposed to measure as defined by the objective and nothing else; objectivity--the personal viewpoints of the scorer do not affect the score achieved; comprehensiveness--it measures all or as many instructional objectives as possible; and differentiation--it can detect significant differences between the levels of achievement of students, particularly between those who have and have not mastered instructional objectives.

The basis for choosing one measuring instrument over another is whether the instrument contains the five qualities of an effective evaluation. Frequently, to evaluate students correctly, a variety of methods should be used. In choosing between any two equally valid means of evaluation, the instructor should decide on the basis of simplicity.

Chapter 21

CONSTRUCTING AND ADMINISTERING CLASSROOM TESTS

Undoubtedly, written tests are the most frequently used means of measuring how well students achieve learning objectives. Ideally, the test items we write will be so mechanically sound that only students who have mastered our course content will be able to answer them correctly. Others, including "test-wise" students, will be able to do no more than guess. Writing such items is not easy, but the results of writing sound test items are highly rewarding. In Chapter 22 we will learn more about how to write test questions that measure our instructional objectives. This chapter contains general suggestions for preparing test items and specific suggestions for writing selection items (multiple-choice, matching, and true-false) and supply items (essay, short answer, and completion). The relative advantages and disadvantages of selection and supply items are also discussed. To further assist your understanding of test-construction principles, a poorly written test item and a corrected example follow the discussion of each type of test item. Finally, this chapter also addresses important considerations involved in structuring and administering written tests, and the scoring of supply items. Approaches to the scoring and grading of selection items are discussed in Chapter 25, Norm-Referenced Analysis.

SUGGESTIONS FOR PREPARING ANY TEST ITEM

The following are general suggestions to consider when writing test items of any type:

1. Keep the wording simple and direct. Test items are not the place to show off one's vocabulary. State items in the working language of the student and the job.

2. Avoid tricky or leading questions. Many people attempt to write "tricky" items in hopes that only the better students will pick up the trick. Unfortunately, they may not and, therefore, do not receive credit for items they are actually able to answer.

3. Keep all items independent of other items on the test. No item should give away the answer to another question. Also, the answer to one item should not depend on having to know the answer to another item.

4. Crucial words or phrases in the stem should be underlined, capitalized, italicized, or otherwise highlighted. If possible, avoid negatives altogether; it is amazing how many people miss negatives even when they have been capitalized and underlined.

5. Include sketches, diagrams, or pictures when these will present information to the student more clearly than words.

In summary, be fair, clear, and straightforward. If we write and use enough good test items, we will identify the students who have mastered our curriculum and those who have not.

SELECTION TEST ITEMS

Selection test items require students to select the correct response from a list of responses. Multiple-choice, true-false, and matching are examples of selection items.

Selection test items have three major advantages. First, since students only have to identify the correct answer, two or more people can score selection items without letting personal bias or opinions affect the result. These items lend themselves well to scoring by clerical assistants or a computer.

Second, selection items take comparatively little time to answer. Students only have to read the item and choose between the responses provided rather than write out their answers. Thus, in a given period of time we can give students more selection items to answer than we could supply items. If testing time is limited, this enables instructors to be more comprehensive in the amount of course material we test.

Finally, selection items can be readily analyzed statistically. Since answers to selection items are either right or wrong, statistical analysis is relatively easy. The quantitative measures referred to in Chapters 24 and 25, such as the ease index, differentiation index, and phi coefficient can be machine computed quite easily.

A distinct disadvantage of selection test questions is the possibility of successful guessing. Students have a fifty percent chance of correctly answering true-false items and about a twenty-five or thirty-three percent chance (depending on the number of choices) of answering multiple-choice items correctly. The percentage for matching items depends upon the format. To offset this weakness, test writers should adhere to the mechanics for writing good test items which help minimize successful guessing.

Multiple-Choice Items

The multiple-choice item can be used to measure student achievement and works equally well when a test problem has one *correct* answer or one *best* answer from an assortment of plausible answers. When possible, completion and essay items should be used to measure such student behaviors as *explain*, *define*, and *describe*. If constraints on the testing program do not permit use of supply-type questions, multiple choice items may prove to be a suitable alternative.

Constructing Multiple-Choice Items. Certain standard terms are used in the construction of multiple-choice items. The preliminary sentence that poses the question or states the situation is known as the "stem." Possible answers that can be selected by the students are known as "alternatives." The correct answer is the "keyed response," and incorrect answers are called "distractors." Distractors are designed to attract less informed students away from the correct answer. The following example illustrates this terminology:

Stem: The communication process consists of which of the following sets of elements?

Alternatives:

a. Words, figures, and signs. }
b. Symbol, receiver, and learner. } Distractors
c. Student, teacher, and receiver. }

d. Symbol, receiver, and source. → Keyed Response

Multiple-choice items usually provide three, four, or five alternatives. In most instances, it is difficult to design more than five plausible alternatives (alternatives that appear correct to a student who has not mastered the subject matter).

Properly designed multiple-choice items do not permit students to easily guess the correct answer. An effective and valid means of diverting the less informed student from the correct response is to use incorrect answers commonly made by students as distractors.

Questions designed to measure the knowledge level of learning should provide only one correct alternative; all other alternatives should be factually incorrect. In questions designed to measure achievement at higher levels of learning, some or all alternatives should appear to be reasonably acceptable responses, but one alternative should be a better response than all the others. In either case, instructions to students should direct them to select the correct or best alternative.

Stems. In preparing or revising the stem of a multiple-choice item, the instructor should observe the following general principles:

- Write the stem so it clearly represents the central problem or idea. The function of the stem is to set the stage for alternatives.

- Place in the stem only the material that is relevant to the idea or to the solution of the problem (unless selection of relevant material is part of the problem).

- Make sure the stem does not reveal the correct response. Avoid clue words or phrases.

- Include in the stem language common to all alternatives to avoid repetitious wording and save reading time for the student.

- Avoid any wording unnecessary to answer the question.

- Avoid negative statements whenever possible because they often confuse the student.

- Exercise caution when using the articles "a" or "an" at the end of the stem. These articles may reveal the correct response if all alternatives do not conform grammatically to the stem.

Alternatives. The alternatives are as important as the stem. In preparing or revising the alternatives to a multiple-choice item, the instructor should observe the following principles:

- Make sure that incorrectness is not the only criterion when developing distractors. Distractors may include any of the following: (1) a response that relates to the situation and sounds plausible but is incorrect; (2) a common misconception; (3) a statement that is true in itself but does not satisfy the requirements of the stem, or (4) a statement that is either too broad or narrow for the requirements of the stem.

- Avoid clue words. Students with experience in taking tests usually recognize that statements containing such words as "all," "always," and "never" are likely to be false. Similarly, statements containing such words as "usually" or "sometimes" are likely to be true.

- Make sure that all alternatives are approximately the same length. We often use longer statements in the correct alternatives than in the incorrect ones, and this may be a clue to the correct answer.

- When alternatives are numbers, list them in ascending or descending order of magnitude.

- Make all alternatives plausible to the student who has not achieved the required level of learning in the subject matter being tested.

- Place correct alternatives in random positions throughout the total test. The instructor should avoid a consistent pattern of correct answers within a test or in a series of tests.

- Avoid use of the alternative "all of the above" and use "none of the above" with extreme caution. The "all of the above" option makes it possible to answer or guess the answer to the item on the basis of partial information by noting other correct or incorrect alternatives. The "none of the above" option may be measuring nothing more than the ability to detect incorrect answers, which is no guarantee the student knows what is correct.

Examples of Multiple-Choice Items. Multiple-choice items may be written in a variety of forms, as shown in the following examples:

Stem written as a question. This is usually a better form than the incomplete stem, because it is simpler and more natural.

What is the purpose of an Oak Leaf Cluster? To

a. be awarded in lieu of a repeat decoration.

b. denote the award of a decoration in lieu of a ceremony.

c. denote presentation of a decoration at an official ceremony.

d. use with miniature ribbons on the mess dress uniform.

Stem written as an incomplete statement. Care must be exercised in using this form to avoid ambiguity, clues, and unnecessarily complex or unrelated alternatives.

The order in which military persons enter staff cars is

a. according to the commander's desire.

b. ascending according to rank.

c. descending according to rank.

Multiple response. In this form, more than one of the alternatives is correct and students are instructed to mark all correct answers.

Why are summer days hotter than winter days? In the summer,

a. the earth is nearer the sun.

b. days are longer than nights.

c. the sun shines almost straight down on the earth.

d. the earth's axis is at a greater angle to the sun.

Definition. Two varieties of this form are shown. The form illustrated by the first item is normally more difficult for the instructor to prepare and for the student to choose the correct response. The criterion objective used to describe the first item would be quite different than that for the second item.

"Hypergolic" is defined as a

a. hydrazine-based liquid rocket fuel used as a propellant.

b. rocket fuel or propellant that ignites spontaneously upon contact with the oxidizer.

c. solid propellant in which the fuel and oxidizer are a part of the same chemical compound.

or

A rocket fuel or propellant that ignites spontaneously upon contact with the oxidizer is known as

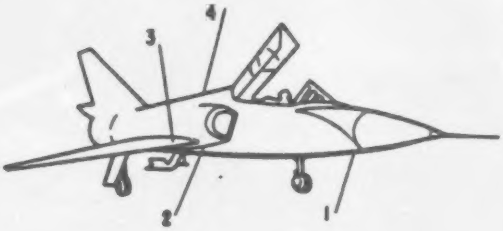
a. hyperon.

b. hypoxic.

c. hydrazine.

d. hypergolic.

Stem supplemented by an illustration. This form is useful for measuring the ability to read instruments, identify objects, use principles in hypothetical situations, and so forth.



To refuel an F-106, where is the fuel nozzle inserted?

a. 1.

b. 2.

c. 3.

d. 4.

The negative variety. This form always emphasizes the negative word. Which is NOT a surface-to-surface missile?

a. Minuteman.

b. Polaris.

c. Pershing.

d. Bomarc.

Association. This form is useful if a limited number of associations must be made. (Matching items serve better if a large number of related associations are required.)

Which of the following is a rotary wing aircraft?

a. OV-10 Bronco.

b. UH-1 Huey.

c. T-38 Talon.

d. C-130 Hercules.

Problem-situation. A problem-situation format poses a realistic set of circumstances leading to a problem for students and asks them to find the correct or best solution from among the alternatives. The problem-situation may require that students recall and select facts or it may require more analytical and reflective thinking.

Certain principles should be followed in developing the problem-situation format:

- Make both the situation and the problem realistic. Whenever possible, an actual situation should be presented.
- Make both the situation and the problem specific. Allow no confusion regarding details or requirements.
- Limit problems so that students may respond to them in the allotted time.
- In the interest of economy and efficiency in testing, construct several test items to exploit as many aspects of a single situation as possible.
- Add unimportant details at times to determine the student's ability to select the important facts.
- Do not present a situation previously presented to the student. The situation should, however, require the use of applicable course content.

As the problem-situation format is discussed under other types of items in this chapter, refer to the principles described above to assist you in the development of this useful format.

The following is an example of the problem-situation format used with the multiple-choice item type.

Sgt Smith and Sgt Jones are in the same academic section. Every time the instructor asks a question these two individuals banter and bicker among themselves trying to prove the other incorrect. This disrupts the entire class, and no one concentrates on the subject at hand.

According to the text, which type of military discipline should the instructor use?

a. Preventive--the instructor should educate the students on behavior appropriate for the classroom.

b. Corrective--the instructor should separate the disruptive individuals before the situation becomes uncontrollable.

c. Punitive--the instructor should warn the individuals that if disruptive behavior continues punishment will follow.

Suggestions for Writing Multiple-Choice Questions

The checklist below contains suggestions for constructing sound multiple-choice questions. This checklist can be used as a guide for writing multiple-choice questions, as well as for analyzing one that has already been written. The multiple-choice question which follows violates one or more of the suggestions included in the checklist. An analysis of the checklist and then a corrected version of the question are given. It is good practice to use the checklist to identify errors, to rewrite the items, and to compare the rewrite to the corrected version. Read the first question on the checklist and then see if the item is satisfactory. Do this in order for all seven questions.

ITEM: An instructor wants to use a written test to ascertain a student's organizational ability. Vis-a-vis other types of tests, of the following the instructor would probably use an

a. multiple-choice test.

b. true-false test.

X c. essay test.

d. performance rating test.

	YES	NO	STEM
1			Key words and negatives emphasized?
2			Simply and clearly worded?
3			Free of clue words and giveaways?
			ALTERNATIVES
4			Brief-all common wording in stem?
5			Only one clearly correct/best answer?
6			All distractors plausible?
7			All about same length or arranged by length?

Checklist Analysis: Using the checklist discussed earlier, let's analyze the mechanical soundness of this test item.

Question 1. Are key words and negatives in the stem emphasized? NO. Normally such words as "probably," "most likely," "best," and "no" in the stem are capitalized, underlined, or otherwise brought to the student's attention as having particular importance in the context of the test item. Depending on the writer's intent, almost any word in the stem may be a key word.

Question 2. Is the stem simply and clearly worded: Frequently, this issue is open to subjective judgement. In this case, however, it is obvious we should check NO. A good way to keep the stem simple is to ask other instructors if they understand it.

Question 3. Is the stem free of clue words and giveaways? NO. "Essay test" is the only answer that agrees grammatically with the article "an" in the stem.

Question 4. Are alternatives brief and is all common wording in the stem? NO. "Test" is unnecessarily included in all alternatives. Eliminating repetition in the alternatives often gives the student a more clear and concise answer from which to choose.

Question 5. Is there only one clearly correct/best answer? We must understand the material ourselves to make this judgement. The best way to assure that there is only one correct or best answer is to write out why it is correct and why the distractors are incorrect. This explanation is called the "rationale." Writing out a rationale for each item not only helps assure one best answer, but also aids us or other instructors administering the test to explain the answers. In this item, there is one best answer. YES.

Question 6. Are all distractors plausible? Except in obvious cases, this can be a real judgement call. We frequently learn whether distractors are really plausible or not only after the test is given. Then we can see how many students selected each alternative. In this particular item, the last distractor (Alt d) is not plausible. A performance rating test is not a written test. NO.

Question 7. Are alternatives about the same length or arranged by length or other logical order? YES. However, inexperienced test item writers usually make the correct answer the longest answer. This is often because they wish to be fair by spelling out the correct answer as accurately as possible. No such effort is required to make an incorrect answer more incorrect. It is also frequent practice to "hide" a correct answer in the middle of the alternatives. The tendency toward writing longer correct answers can be reduced with practice. The tendency to hide answers can be eliminated by arranging alternatives in logical order. When no other logical order is apparent, arrangement in alphabetical order or by length will suffice. In this item, the alternatives could have at least been arranged alphabetically.

We've answered NO to Items 1, 2, 3, 4, and 6 on our checklist and have the appropriate changes to our corrected item below:

CORRECTED ITEM: A student's ability to organize material can BEST be measured by using which type of written test?

a. Completion

b. Essay

c. Multiple-choice

d. True-false

Matching Test Items

The matching item with several variations, presents many of the advantages of the multiple-choice item. It is particularly useful in measuring understanding of closely related concepts or facts. The matching item is actually a collection of related multiple-choice items. Thus, the matching format provides a more compact form for measuring the same learning and can allow the more efficient use of testing time.

Constructing Matching Test Items. The instructor should observe the following principles in constructing matching test items.

- Give specific and complete instructions. Do not make students guess what is expected of them.
- Test only essential information; never test for unimportant details.
- Use closely related materials throughout an item. When students can divide the set of alternatives into distinct groups, the item is reduced to several multiple-choice test items with just a few alternatives and increases the possibility of guessing the correct answer.
- To minimize guessing by elimination, make all alternatives plausible.
- Arrange the alternatives in some logical order. An alphabetical arrangement is common.
- If alternatives are not to be used more than once, provide three or four extra to reduce guessing.

Examples of Matching Items. Like multiple-choice items, matching items can be constructed in a variety of forms: equal columns, unequal columns, inference matching, cause and effect matching, and coded alternatives for scientific reasoning.

Equal columns. When using this form, the instructor should plan to use some items in the response column more than once, or not to use them at all, to preclude guessing by elimination.

Directions: In the blank before each base in Column A, write the letter corresponding to the name of the state where it is located in Column B. Each state may be used more than once; some not at all.

		Column A		Column B
		Base		State
___	1.	Eglin AFB	a.	Alabama
___	2.	England AFB	b.	Florida
___	3.	Plattsburg AFB	c.	Indiana
___	4.	Maxwell AFB	d.	Louisiana
___	5.	Grissom AFB	e.	New York
___	6.	Rickenbacker AFB	f.	Ohio
___	7.	Griffis AFB	g.	Tennessee

Unequal columns. This form is preferable when alternatives may not be used more than once.

Directions: Write, in the parenthesis before each statement, the number of the location in Column B to which the statement in Column A applies. Each location may be used once, more than once, or not at all.

Column A	Column B
( ) 1. The eastern end of this island is located directly south from the easternmost part of the United States.	1. Bermuda 2. Cuba 3. Haita
( ) 2. Would be crossed in a direct flight from Key West to the Panama Canal.	4. Jamaica 5. Nicarauga
( ) 3. Etc. to a maximum of nine statements.	

Inference matching. The item below would probably measure learning at the comprehension level.

Directions: Which of the following characteristics of a good test are implied or referred to in the statements below? Fill in the space on your answer sheet corresponding to the letter of the term which you believe is implied or referred to by the speaker. Each of the characteristics may be used once, more than once, or not at all.

a. Differentiation.

b. Validity.

c. Objectivity.

d. Comprehensiveness.

___ 1. "Well, I've finally finished constructing this test and it contains items at all levels of difficulty."

___ 2. "After grading this test, I have the feeling that even the students who did well don't understand the subject material."

___ 3. "Thirty test items cover this entire unit?"

___ 4. "I wonder if this test will really tell me what the students know about the subject matter?"

___ 5. "Be sure you follow the key because it is the only fair way to judge students."

___ 6. Etc.

Cause and effect matching. This is a useful form to measure learning at the comprehension level.

Directions: Listed below are certain facts followed by several statements. Fill in the space on your answer sheet corresponding to the letter (a, b, or c) which represents the best statement of the relationship between each statement and the fact which precedes it.

a. The statement is the cause of the fact.

b. The statement indicates a result of the fact.

c. The statement is not related to the fact.

Fact: A flash of light occurs.

Statements:

1. A roar of thunder can be heard.

2. Electricity passed between clouds and the earth.

Fact: Metals, generally speaking, expand when heated.

Statements:

3. Like poles of a magnet repel each other.

4. After driving the car for several miles, the individual found it difficult to remove the spark plugs.

Coded alternatives for scientific reasoning. This type of matching item can be used to differentiate the achievement levels of better students. Items of this type normally measure achievement at least to the comprehension level.

Directions: Below are some hypotheses and methods for testing them. On your answer sheet, fill in the space corresponding to the following conditions:

a. if the item directly helps to prove the hypothesis true

b. if the item indirectly helps to prove the hypothesis true

c. if the item directly helps to prove the hypothesis false

d. if the item indirectly helps to prove the hypothesis false

e. if the item is unrelated to proof or disproof of the hypothesis

Hypothesis: Thunder causes rain.

1. Observations show that, during a rain storm, it always begins to rain immediately after a clap of thunder.

2. The meeting of cool and warm air masses simultaneously causes thunder and precipitation.

Hypothesis: High temperatures for a few days cause rain.

3. Heated water in a pan evaporates.

4. Many desert areas exist with virtually no vegetation.

Suggestions for Writing Matching Items.

Here are some suggestions, again in the form of a checklist, for writing mechanically sound matching test items.

	YES	NO	INSTRUCTIONS
1			Clear what is to be matched?
2			Where and how to match?
3			Indication of number of times each alternative can be used?
4			ITEM FORMAT One column contains more entries than the other?
5			Spaces provided for responses?
6			Column requiring more reading on the left?
7			Each column composed of similar materials and appropriately titled?
8			Alternatives arranged in some logical order (alphabetical, numerical, or chronological)?

The item that follows violates one or more of these checklist questions. Again, Please use the checklist to analyze this test item.

ITEM:

1. Uniform Code of Military Justice
2. Status of Forces Agreement
3. Command Regulations

a. Establishes rights, privileges, rules, and punishment for military personnel.

b. Provides for controls over duties, customs, and privileges of military personnel in a foreign country.

c. Implements controls over duties, customs, and privileges of military personnel in a foreign country.

Checklist Analysis:

Question 1. Makes clear what is to be matched? NO

Question 2. Indicates where and how to match? NO

Question 3. Shows number of times alternatives may be used? NO

Question 4. One column is longer than the other? NO

Whenever one or both of these last two suggestions is ignored, it usually means there is one and only one correct response in the second column to each problem posed in the first column. Therefore, students who can match any alternative find it easier to match remaining alternatives.

Question 5. Provides space for responses? NO

Question 6. Column requiring more reading than the other is on the left? NO

In the sample question, students may have to read through the long definitions in the second column several times over to complete the question.

Question 7. Each column composed of similar materials and appropriately titled? Similar materials? YES. Titled? NO

Question 8. Alternatives arranged in logical order? NO. As in multiple-choice items, alphabetical order or length is useful when no more logical order is obvious.

CORRECTED ITEM.

As we can see by entering NO in questions 1 through 8, what this item primarily needs is a set of instructions plus a little cleaning up. Check the corrected version below.

INSTRUCTION: Match the legal instruments in Column B to their definitions in Column A in the space provided. Each instrument may be used once, more than once, or not at all.

A - DEFINITIONS	B - LEGAL INSTRUMENTS
1. ___Establishes rights, privileges, rules and punishment for military personnel.	a. Code of Conduct b. Command Regulations c. Status of Forces Agreement
2. ___Implements controls over duties, customs and privileges of military personnel in a foreign country.	d. Uniform Code of Military Justice
3. ___Provides for controls over duties, customs, and privileges of military personnel in a foreign country.	

True-False Items

True-false items are useful in testing knowledge of facts, especially when there is little question whether a statement about a fact is either right or wrong. True-false items may also be used to determine the persistence of popular misconceptions when the suggestion of a correct response in a multiple-choice item would be too obvious. The chief disadvantages of the true-false item is that the possibility of correct guessing, particularly in simple items, is greater than in any other types of selection test items.

True-false items have probably been used and misused to a greater extent than any other selection test question type. Too often, instructors merely scan text material, select statements more or less at random, and then insert negatives in approximately one-half of the statements to make them false. They mistakenly believe that they can justify answers to these items by referring students to pages in the text. When tests are constructed in this manner, the principal attribute measured is photographic memory. Tests of this sort have brought objections to selection tests in general and true-false items in particular.

Constructing True-False Items. The instructor should observe the following principles in constructing true-false test items:

- Include only one idea in each true-false item.

- Do not make part of a statement true and another part false.

- Avoid the use of negatives. They confuse the reader.

- Avoid involved statements. Keep wording and sentence structure as simple as possible. Make statements clear and definite.

- Whenever possible, use terms that mean the same thing to all students. Short, simple statements will increase the likelihood that the point of the item is clear and that passing or failing it will be determined by the students' learning, not their reading ability.

- As a rule, avoid absolutes, such as "all," "every," "only," "no," and "never." Such unequivocally true or false statements are rare, statements containing absolutes are usually false. Similarly, avoid statements containing "some," "any," and "generally," which are most frequently true. These terms are often called "hedgers."

- Avoid patterns in the sequence of responses because students can often identify sequence patterns. Instructors sometimes deliberately use patterns to make hand scoring easier. This is poor practice.

- Make statements brief and uniform. Some instructors unconsciously make true statements longer than false statements. Students are quick to take advantage of this tendency.

Examples of True-False Items. True-false items may be written in the forms shown in the following examples:

Declarative statement.

T F Winds circulate clockwise around a high pressure area in the Northern Hemisphere.

Cluster.

The M-16 Rifle

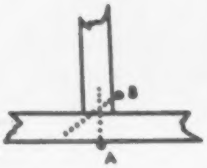
T F stock is constructed of high grade walnut.

T F is chambered for a .223 caliber cartridge.

T F may be set to fire either automatic or semi-automatic.

T F disassembly kit is stowed under the butt plate.

Statement with illustration.



T F Nail "A" will make a stronger joint than nail "B."

Double true-false.

Directions: Indicate your answer in the space provided to the left of each statement, as if the statement is

a. true and the reason is correct for the statement.

b. false and the reason is incorrect.

c. true and the reason is incorrect.

d. false and the reason is correct.

____ Statement: Aluminum is used in transportation.
Reason: Aluminum is light and strong.

____ Statement: Most items made of metal corrode.
Reason: Many metals corrode.

Other items of this general type have also been devised to reduce guessing to a minimum. These include adding to the basic true-false choice the choices of "sometimes true—sometimes false," and similar variations. In addition, this type of item can be made more difficult and discriminating by requiring the student to suggest what will make false statements true.

Suggestions for Writing True-False Items. Here is another checklist which summarizes the principles for constructing mechanically sound true-false items.

	YES	NO	ITEM FORMAT
1			Short and simply stated?
2			Tests only one idea?
3			Free of absolutes and/or hedgers?
4			Stated positively?
5			Totally true OR false?

The true-false item that follows violate one or more of the principles of sound construction in the above checklist.

ITEM:

In general, the characteristic of evaluation which is never violated by experienced writers of selection test items is validity, and this is a function of training and experience.

Checklist Analysis: Using the checklist provided earlier as a guide, let's examine the above true-false item for quality of construction.

Question 1. Is the item short and simply stated? NO. Although the words used in the item may well be understood by the informed student, the sentence structure is awkward and fragmented, making it difficult for the student to grasp its meaning.

Question 2. Does the item test only one idea? NO. The item addresses two distinct points, one regarding the violation of a certain characteristic of evaluation and the other regarding a possible explanation for such a violation. Not only is this confusing to students, it creates problems in interpreting what students understand or do not understand about that question's content.

Question 3. Is the item free of absolutes and hedgers? NO. In this question, the hedger "In general" and the absolute "never" are not only misleading and imprecise, but are also contradictory. Avoid these types of terms whenever possible.

Question 4. Is the item stated positively? YES.

Question 5. Is the item totally true or false? NO. This is a frequent occurrence when attempting to test more than one idea with one item, as discussed in Item 2 above.

Corrected Item:

T F Improved validity of test items is the most frequent result of training the writers of test questions.

SUPPLY TEST ITEMS

A supply test item requires students to furnish their own answers. They are not given alternative responses from which to choose. The basic forms of supply questions are completion, short-answer, and essay.

Supply test items are mechanically easier to construct than selection items, but are far more difficult to evaluate.

When the ability to express ideas or original thinking are to be measured, supply items have a distinct advantage over selection items. The ability to solve problems and to think creatively are seldom worthwhile end products in themselves; it is usually necessary to communicate the solutions or ideas to others, frequently in writing. When development of the ability to write clearly is a legitimate objective of a course, supply items may be used effectively. Test items that call for a written discussion, such as the essay form, also give students an opportunity to express themselves--something students often like to do.

It is difficult to construct a supply item for which comparable scores can be given by several equally competent instructors. This difficulty in attaining objectivity often leads to reduced test reliability. It is not usually possible for clerical assistants to score supply test items. Understanding of subject matter area covered by the test is usually required. As a rule, this means that the instructor must score supply items. The supply item also requires considerably more time to score than a selection item.

Another disadvantage of the supply item stems from the ability of students to think and read more rapidly than they write. Consequently, in a given time block, this type of test may be less comprehensive than a selection item test.

Completion Items

Completion items require the student to provide one or more words omitted from a statement. When the correct word or words are supplied in the proper blank, the statement is complete and true. The completion item offers the following advantages:

- It requires the student to supply at least part of the idea expressed in the statement.

- It virtually eliminates the possibility of guessing.

- It is a time-saving device in comparison with the essay test.

The completion item can be used in testing student ability to make verbal associations of the who, what, when, where and why types. However, since it is difficult to construct items that require but one correct response, the scoring of completion items is normally less objective than scoring of selection items. Even after determining that a given response is correct, instructors frequently must decide to give part or full credit for responses that they did not anticipate. For this reason, as explained further later in this chapter, they should make a complete scoring key (for any supply item) at the same time that they prepare the item.

Constructing Completion Items. Instructors should observe the following principles in construction of completion questions:

- Construct a completion item so it contains only one blank in each sentence. Multiple blanks in a sentence can quickly lead to ambiguity and, therefore, to reduced validity and reliability.

- Write the statement so that the blank appears at or near the end of the item. This arrangement provides the student with necessary information to fill in the blank without having to read through the item twice.

- Be sure there is only one correct or best response for each blank. In the interest of scoring objectivity and overall test reliability, both the students and the instructor should have a clear understanding of the criteria for acceptable responses.

- When testing comprehension and higher levels of learning, word completion statements differently from the way they were worded in texts or lectures. If they are not expressed in different words, the test will measure a level of learning no higher than the knowledge level, regardless of the form of the question or the subject matter.

- Make all blanks uniform in length. Blanks adjusted to the length of the anticipated response may provide a clue to the correct answer. Directions for completion items should state that the length of the blanks does not indicate the length of the nature of the response. They should also indicate whether a single blank always requires one word or whether short phrases may sometimes be supplied.

- For convenience and accuracy in scoring, include on the test page a separate series of blanks arranged in a vertical column. Students should be instructed to provide their responses in these blanks rather than in the blanks within the items.

Examples of Completion Items. Completion test items may be constructed either as incomplete statement or as sentences or paragraphs with key words omitted. The following are acceptable examples of completion test items.

Incomplete statement. This type is more difficult for the student than the direct-question form of short-answer item. The instructor must constantly be on guard to avoid ambiguous, incomplete statements, such as "Columbus was born in...," which could be answered with a city, country, or year.

The name of the man who first successfully flew the airplane is __________.

The Air Force became a separate branch of the military in 19__.

Sentence or paragraph completion. Omit only key words or phrases. Avoid copying from textbooks.

The (1) ____ of a sound varies 1. ____
(2) ____ as the square of the
distance from the source. 2. ____

or

In 1795, Napoleon was given 1. ____
command of a small army in
(1) ____. 2. ____
The wonderful genius of the 3. ____
young leader made the
(2) ____ campaign the 4. ____
decisive factor. By rapid
movements he separated 5. ____
(3) ____ and (4) ____ forces.
In eleven days he forced
(5) ____ to conclude peace.

Suggestions for Writing Completion Items. The brief checklist below can be of assistance in implementing the principles for writing sound completion items.

	YES	NO	ITEM FORMAT
1			Blank(s) at or near end of sentence?
2			Blanks approximately same size?
3			Blank(s) related to key terms?
4			Worded so that response possibilities are limited?

The question that follows violates one or more of these checklist items.

ITEM:

____, ____, ____, ____, and ____ are usually presumed to be the most common functions of management taught by educators in ____.

Checklist Analysis.

Question 1. Is there a total of one or two blanks at or near the end of the sentence? NO. As blanks increase in a completion item, so does the ambiguity of that item. Also, blanks at the beginning of the sentence cause students to re-read frequently in attempting to grasp the sense of the statement.

Question 2. Are blanks approximately the same size? NO. The variable lengths of blanks may provide clues to the keyed responses and may confuse students unnecessarily. Keep blanks the same length and provide clear instructions regarding their use.

Question 3. Are blanks related to key terms? Probably NO, although it would depend upon the actual keyed responses. It appears that the blank at the end of this item is requesting something less than key information.

Question 4. Is the question worded so that response possibilities are limited? NO. Besides the fact that the information requested in the final blank may be interpreted by students in a number of ways, the lack of a source reference in the sentence would seem to permit student opinions as acceptable responses.

CORRECTED ITEM:

According to the article written by George S. Odiorne, the two most common functions of management are _____ and _____.

Short-Answer Items.

In general, the short-answer item as a type of supply test item includes features of both the completion and the essay item. It may be used in measuring ability to recall facts, basic concepts, and principles.

The advantages and disadvantages of the short-answer item are essentially the same as those of completion questions. However, the short-answer item often tests ideas more fully, since the recalled idea must be stated in a more complete form.

Constructing Short-Answer Items. Instructors should observe the following principles in constructing short-answer test items.

- Be specific. The student should know exactly what is expected. If the instructions are not specific, test results are likely to be unreliable and invalid.
- Be sure that each required answer involves a simple idea, concept, or fact. Otherwise, a meaningful evaluation of student responses becomes quite difficult.
- Be sure students know how complete to make their responses. Usually, the wording of the item can provide this information. Sometimes, the amount of space will indicate the length of the response. However, the amount of space provided for a response should not be a clue to the correct answer; it should serve only as a guide to the desired length of the response.

Examples of Short-Answer Items. Short-answer test items may be constructed in the following forms: direct question, association, short explanation, list, and pictures or diagrams.

Direct question. This form is usually easier for the average student than a completion item since it helps eliminate ambiguous elements. What are the two main classifications of rocket fuel?

______ and ______.

or

Who was the first Secretary of Defense?

____

Association.

After each base name, write the name of the primary using command (ATC, SAC, TAC, MAC, etc.).

Langley AFB ______

Travis AFB ______

Barksdale AFB ______

Hill AFB ______

Luke AFB ______

McGuire AFB ______

Etc. ______

Short explanation. This form can be used to obtain maximum comprehensiveness with a minimum of guessing.

Explain, in one sentence, a significant contribution that each of the following men made to the development of military aviation.

General Benjamin Foulois______________
General Billy Mitchell________________
Captain Eddie Rickenbacker____________
General James Doolittle_______________

List. This form is especially useful for informal classroom teaching. List at least four significant reasons why flying safety practices are important.

a. ______________________________

b. ______________________________

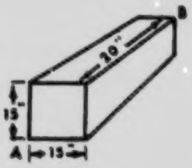
c. ______________________________

d. ______________________________

e. ______________________________

Picture or diagram. Pictures or diagrams often add clarity, speed the testing process, and make testing more interesting and valid.

Directions: Study the drawing at the right and write your answer to each question in the appropriate blank.



____1. What is the horizontal distance from point A to point B?

____2. What is the volume of the polyhedron

____3. Etc.

Since short-answer items are so similar in construction to essay items, suggestions for writing short-answer items are included in the next section.

Essay Items

Any sharp differentiation between short-answer and essay items would be a compromise at best. Fortunately, such a distinction is not necessary. The difference between the two forms is perhaps more noticeable in the length of responses than in the wording of the items themselves.

The essay is probably the least efficient form of item for measuring simple recall (knowledge level of learning). It should be used only when students are required to think reflectively or creatively, to organize knowledge in the solution of a problem, and to express their solution in writing.

The major disadvantage of essay items is the scoring. For this reason, instructors should make a complete scoring key for each essay item when they first prepare it. The construction and use of the scoring key will be explained later in this chapter.

One of the difficulties in constructing essay items is that the process appears too easy. Like selection items, however, essay items with good scoring keys are quite difficult to construct.

Constructing Essay Items. Before preparing an essay question, instructors must understand the objectives to be measured. They must also give clear instructions concerning the kind and length of responses that they require. Items of equal value on a test should be balanced in difficulty. Instructors should not offer students a choice of questions; unless all students provide answers to the same test items, they cannot evaluate the students' achievement of the same objective.

Other principles to observe in constructing essay test items are:

- Generally, use essay items for purposes which they are best suited, that is, to measure achievement at the comprehension or higher level of learning.

- State the items clearly so that students will know exactly what type of discussion is required. It is a mistake to use vague essay questions in an effort to test ingenuity. If the items are skillfully designed, students will have ample opportunities to apply their ingenuity and creativity. Essay test items should mean essentially the same thing to all students who have achieved the desired level of learning. Revise or eliminate all items with a double meaning.

- Whenever possible, increase the number of test items and reduce the amount of discussion required for each. This will not only make scoring easier, but will also probably increase the comprehensiveness of the test.

- Suggest a time limit for each item, indicate the desired length of response, or otherwise limit responses.

- As part of the instructions to students, explain how each item affects the final score of the overall test and the possibilities of partial credit for each item. Every student should understand the criteria used in the scoring process.

- Avoid making the answer to a first item the basis for a second item. Items linked in this manner may cause a student to miss an entire series of test items although they may be wrong on just the first. It is nearly impossible to interpret results in such situations.

Examples of Essay Items. Essay items may be designed and classified in various ways. One classification can be made according to the type of response required of the student. Seven major types of essay items based on this classification are shown in the following examples.

Comparison

In 100 words or less, compare norm- and criterion-referenced measurement. This question is worth 20 points and no partial credit will be awarded. Up to five points may be deducted for grammar and organization.

Decision

Defend with specific support the assertion that the death penalty should be abolished. You will have 20 minutes to answer this question. The question is worth 25 points and partial credit may be awarded. No points will be deducted for spelling and grammar.

Causes or Effects

In the space provided below, discuss how institutional racism inhibits social progress in the United States. Support your answer with specific examples. The value of this question is 15 points with partial credit available. Spelling, grammar, and organization will not be graded.

Explanation

In 250 words or less, explain the principles involved in airfoil lift. This question is worth 30 points; partial credit is available. Up to three points will be deducted for spelling, grammar, and organization.

Summary

Summarize in 300 words or less the functions of management. Your answer should be supported with specific, personal examples. This question is worth 50 points with partial credit available. Up to ten points may be deducted for organization, clarity, and grammar.

Illustration

In the space provided below, illustrate the peculiarities of high-speed aerodynamics. Limit your answer to verbal descriptions and use examples when appropriate. This question is worth 25 points with partial credit available. No points will be deducted for spelling, grammar, or organization.

Read the following situation, then answer the two questions provided. Question 1 is worth 10 points; question 2 is worth 15 points. Partial credit is available. For full credit, your answer should contain specific, relevant support for all conclusions made. No points will be deducted for spelling, grammar, or organization.

Another classification of essay items can be made according to format. The following essay item represents an attempt to present a realistic situation and to guide the student's responses.

Situation

Captain Jones is a management analyst at Randolph Air Force Base. You are the comptroller. Five months ago the maintenance squadron commander requested a study of his maintenance control system. You gave Captain Jones the assignment. He is young and aggressive and, although he had no maintenance experience, you felt he could handle the job. A recent check on his progress showed the following developments:

a. He has not completed any studies but reported varying degrees of progress on seven different studies, with "three more in the planning stages." Of the seven, two were held up because of a deadlock between Captain Jones and the officers in charge of the areas in which he was making the studies. The two officers in charge stated that he did not understand maintenance problems and that his recommendations were faulty. The other five studies were apparently stagnant.

b. Captain Jones had established requirements for nine temporary reports from maintenance squadron activities to provide him with data in various maintenance areas. The requests for these reports had been initiated at different times.

Directions:

Respond to each of the following questions in no more than 2 handwritten pages. You will have approximately 45 minutes to complete the exam. Your answers will be evaluated on their content alone, and from 0 to 20 points may be awarded for each answer.

Questions

1. In what respect did Captain Jones err most seriously?

2. In the present situation, how can the two studies which have been held up because of nonconcurrence be best completed?

Suggestions for Writing Essay/Short Answer Questions.

The checklist that follows summarizes several of the principles for constructing sound essay and short-answer items. Guidelines for the scoring of these types of supply items are provided later in the chapter.

	YES	NO	
1			Item stated clearly?
2			Point value of the item clearly indicated?
3			How much response is expected (in time, words, or space)?
4			Whether or not partial credit is available?
5			Factors other than content affect the score (e.g., grammar, organization, neatness, spelling)?

The following item can be viewed as either a short-answer or essay item. The principles for the construction of each are virtually the same. Use the checklist to analyze the mechanical quality of this item.

ITEM:

Discuss the concept of discipline as it relates to the Air Force environment.

Checklist Analysis.

Question 1. Is the item stated clearly? NO, not really. "Discuss" by itself does not describe adequately the nature of the desired response. The words "discipline" and "environment" are particularly ambiguous and require more specific direction for the student.

Question 2. Is the point value of the item clearly indicated? NO. Students need to be appraised of the relative weight of the item in the overall test, just as the scoring procedures of other item types are revealed.

Question 3. Is the length of the expected response indicated? NO. Instructions to students should include a realistic guide in terms of time, words, or space for adequately answering the item.

Question 4. Does the item address partial credit? NO. Particularly in an essay item, partial credit may be available. Specifically on what basis that credit will be awarded is of interest to the student.

Question 5. Are factors other than content indicated which will affect the score? NO. Sometimes the total score for the item is not based on the content of the response alone; grammar, spelling, neatness, and organization may be factors considered important enough to score in an essay item. If such factors will be judged, let the student know what and how much.

CORRECTED ITEM:

We have answered "No" to all five questions on our checklist.

In no more than 500 words, explain the relationship between the concept of self-discipline and the accomplishment of the Air Force mission. Provide support for your statements in the form of specific examples, both hypothetical and real. This question is worth a total of 25 points, five points of which will be for organization and grammar. Partial credit may be awarded.

FIGURE 21-1. COMPARISON BETWEEN THE TWO MAJOR TYPES OF TEST QUESTIONS

FACTOR	SUPPLY	SELECTION
Low chance for guessing	Student has to furnish information—no help provided	Student may be able to guess answer or eliminate incorrect ones
Cover a lot of material in a short period of time	Varies with the different supply type tests. The completion test can cover more of a given topic than the essay test which provides only a limited sample	Generally true. A large sampling can be obtained within a regular class period. The multiple choice may not give the adequacy of the sample of the T-F or matching tests, though
Easy to score	Needs evaluator to make judgment, even with short answer questions	A definite advantage is the machine scored answer sheet
Easy to construct	Except for the essay, which requires an extremely well worded question to test the required level of learning, the supply type test item is no more difficult than the selection type test item to construct	The multiple choice test is more difficult to construct than all other type test items. Extreme care must be taken in writing stems and distractors. T-F and matching are relatively easy to construct
Measures all levels of learning	The essay is the best type test item for this factor. Completion type items are useful for lower levels only.	Well constructed multiple choice items can measure all levels, while T-F is primarily for lower levels only
Can be statistically analyzed	Cannot be statistically analyzed. Variety too great	All easily analyzed

ASSEMBLING THE TEST

Once the desired test items have been prepared, we should pay careful attention to putting the overall test together. The first page, or cover page, of each test should include all information required to identify the test. This information should be printed on the first page or the students should fill in blanks. The name and location of the school, name of the course, section number, date, and student code number are often included.

A complete set of instructions, which may be provided in written form, orally, or by visual aid, should specify what text and other references or tools may be used during the test and the time to be allowed for parts or for the total test. The instructions should include a statement of the number of items in the test and should indicate clearly how each student should respond. It is often a good plan to give a sample item with the correct response. The instructions should also tell whether to proceed individually from part to part or from page to page or whether to wait for a signal or further instructions. Students should also be told the procedure to follow when they have completed the test. If reliable testing data is to be compiled for administrative purposes, testing instructions should be kept uniform from class to class.

Test items should be placed on the page so that each item stands out clearly from the others. For example, true-false items two lines long should be single-spaced, but two spaces should be left between items. A space should separate the stem of multiple-choice items and the list of alternatives. The alternatives should appear in a single column beneath the stem and should be indented beyond the paragraph margin.

If tests are to be machine-scored, precautions must be taken to see that the items can be used with machine-scored answer sheets. Special answer sheets can be designed for specific test objectives, while stock answer sheets generally can be used for true-false items, for multiple-choice items with five or less alternatives, and for matching items with 15 or less alternatives.

As nearly as can be anticipated, items should be arranged in ascending order of difficulty within groups. Items of known difficulty which have been used before are readily arranged in order of difficulty. Students are put at ease when they find relatively easy items in the early portion of the test.

A test should be designed to insure that most students can complete it. When many students cannot complete a test, much of its efficiency is sacrificed and student morale is likely to suffer. On the other hand, it may not be desirable that all students complete the test before the end of the allotted time. In that event, a large portion of the group may have to wait for the remainder to finish. If students are allowed to leave as they complete a test in some room arrangements, they may distract and confuse those who are still working.

ADMINISTERING THE TEST

Although the decision of whether to administer a test does not always rest with instructors, we are often allowed to decide when to test. Instructors should arrange for tests to be administered in the morning when students are fresh and alert, rather than in the afternoon when they are tired and less likely to be at their best. The selection of a place to administer the test is equally important for reliable testing results. In a quiet, well-lighted, well-ventilated room with a comfortable temperature, students are more likely to perform at their best. Ample working space is particularly important when separate answer sheets are used and when the students may have to make computations on scratch paper. If students are uncomfortable or if they are distracted by physical surroundings, their scores can be expected to suffer. Also, since some students are affected more than others, scores will be less reliable.

Instructors should arrive at the examination room well in advance of the class to assemble their test materials. Some instructors prefer to have test papers and other materials in place before the students arrive. Extra tests, answer sheets, and pencils should be available. In administering the test, instructors should provide clear and concise instructions to avoid confusion. When they understand exactly what they are supposed to do, students are less likely to become nervous or tense. Therefore, their test scores will represent a more accurate picture of their achievement.

Whether instructors win the confidence of their students in the testing situation depends largely upon their personality and upon the effectiveness of their teaching. They should make every effort to encourage the students and put them at ease.

Although carefully written directions for taking the test should be a part of the test, instructors may wish to give oral directions as well. Before beginning the test, they should invite the students to ask questions concerning procedures and they should make it clear whether questions may be asked of the instructor after the test begins. Any errors, misprints, omissions, or other defects in the test should be found and explained beforehand.

If the test has time limits, these should be announced and observed. Students should be told whether they are free to turn in their papers and leave the room during the period or whether they must remain seated until all materials are collected.

SCORING SUPPLY ITEMS

The procedure for scoring supply items should be explained at the time students take the test. The explanation should include a discussion of the relative weight of each item or problem and its separate parts. With this information, the students can determine how to allocate their time and effort.

Scoring supply items often presents serious difficulties. For reliable test results, the rating assigned to a given paper must be comparable when it is scored by several competent instructors. If one instructor assigns a "Poor" score to a test paper and another instructor assigns a "Good" score to the same paper, the grades may express instructors' bias and not student proficiency.

To achieve scores that are as objective and reliable as possible, the instructor should arrange for more than one person to score each paper. Supply items require a great deal of time to grade, and, since they are highly subjective, they are difficult to evaluate. Instructors may be tempted to assign the best grades to students who use their phraseology or who have otherwise done well in the course.

The principles for achieving objectivity apply to completion, short-answer, and essay test items. Since the essay test is the most difficult test to score objectively, this section includes a detailed discussion of the principles involved in scoring essay tests.

SCORING ESSAY TEST ITEMS

After instructors are satisfied that the essay item is carefully and accurately prepared, the next task is to make certain that as much objectivity as possible is used in grading the responses. The effectiveness of an essay examination depends to a large degree on how well it is graded.

In grading essay responses, one must (1) use appropriate methods to minimize biases, (2) pay attention only to the significant and relevant aspects of the answer, (3) be careful not to let personal idiosyncracies affect grading, and (4) apply uniform standards to all the papers. Undoubtedly, the uniformity of grading standards (hence the reliability of the scores) is probably the most crucial aspect of essay grading. For without uniformity, there is no valid way to measure achievement of objectives.

1. Decide in advance what qualities are to be considered in judging the adequacy of the answer. If more than one distinct quality is to be appraised, make separate evaluation of each. In an essay test, instructors are generally trying to appraise the achievement of objectives that are directly and explicity related to the content areas, such as knowledge of facts, principles, and theories of the content area and the application and development of these to novel situations and problems; they may also wish to appraise the development of generalized skills of writing such as logical organization, English usage, and spelling. These two dimensions are quite different and should be rated separately and reported to the student separately. There are two reasons for this separation: (1) to enable the instructor to make a judgment of the extent to which the student is achieving the distinctive objectives of the subject matter and (2) to reveal to the student whether any deficiency in answering the question is due to weakness in subject matter or weakness in written expression or both.

2. Prepare an answer guide or model answer in advance showing what points should be covered. This measure should help provide a common frame of reference for evaluating each paper and is especially important if the scoring of the papers is spread across a number of different days. After the preliminary guide has been prepared, it should be checked against a sample of responses. No ratings should be given to this sample of papers; the purpose of this step is to determine the adequacy of the scoring guide. If the check reveals that students have consistently interpreted the question at a consistently lower level than the scoring guide, then the specifications of what represents an acceptable answer should be revised to correspond more closely to the performance. Instructors frequently object to this procedure as representing a lowering of educational standards, but it is not. In the majority of cases, differences between the original scoring guide and students' answers are due to lack of clarity in the original question or unrealistic expectations on the part of the instructor of what students can do within the limits of the testing time.

3. Read all answers to one item before going on to the next. Reading the answers for the same item for all students before going on to the next item accomplishes two purposes: (1) instructors can maintain a more uniform set of standards of grading across papers and (2) instructors are less likely to be influenced in their judgment of the quality of the answer to another item by how the student has answered the previous one.

4. Grade the papers as nearly anonymously as possible. The less one knows about who wrote an answer, the more objectively one can judge what was written.

5. Write comments and correct errors on answers to essay items. A test is most effective for motivation and learning when students get prompt, specific information on their strengths and weaknesses. If instructors make a tally of the types of

comments and types of errors, they will also gain valuable information to judge the effectiveness of their teaching.

6. Try to score all responses to a particular item without interruption. One source of unreliability is that the scores may vary markedly from one day to the next and even from morning to afternoon of the same day. We would be very unfair to our students if we allowed a personal argument with one's spouse, a migraine headache, or an upset stomach to influence the grades we give students for their answers. Our scoring is valid only to the degree that it is based upon the quality of the subject's answer and not on the reader's disposition at a particular moment.

Although we recommend that all responses to a particular item be read at the same time, we also suggest that there be short breaks during the reading period. There must be some short diversionary periods so that the reader will not become fatigued.

7. If possible, have two independent readings of the test. A double reading by two independent readers will make the scores more reliable. If independent readings are done, the scores should not be recorded on the test booklet, but should be written on a separate sheet. Seeing the scores from the first reading could markedly influence the scores on the second reading, and thus defeat the aim on maintaining independent scoring.

Figure 21-2 provides us with a sample essay item and instructions. Instructions for answering an essay item should include the length of the essay, time allowed, worth of the item, whether or not partial credit will be given and whether or not spelling, organization and grammar will be graded. Figure 21-3 contains a sample outline for a scoring key. The key lists the most important elements of an answer. The key is helpful to remind instructors about the ideas which they should look for in an answer. However, the instructor's knowledge is still needed to judge the quality of the answers.

ITEM:

Explain how implementing a Management by Objective system might improve worker performance and organizational effectiveness.

INSTRUCTIONS:

Answer this question in 150-200 words, using specific hypothetical or actual examples where appropriate. This question is worth 20 points; up to 5 points may be deducted for organization, grammar, and spelling. Partial credit may be awarded for the content section of the question.

FIGURE 21-2. SAMPLE ESSAY TEST QUESTION

For full credit the student should address with specific examples, the following significant teaching points:

a. MBO is a good motivational tool for the supervisor, although it does not guarantee success (5 points).

b. MBO can have a positive impact upon the meeting of individual and organization needs (5 points).

c. Increased involvement and participation of workers with the job goals and objectives lead to an increase in satisfaction, creativity, and productivity (5 points).

d. Grammar, spelling, punctuation, etc. (5 points).

FIGURE 21-3. SAMPLE SCORING KEY FOR ESSAY TEST ITEMS

SUMMARY

A primary purpose for testing is to improve instruction and, thereby, to increase learning. The grades derived from testing are, at best, a secondary testing objective.

Two broad categories of test items are selection and supply. The selection category includes true-false, multiple-choice, and matching items, all of which provide alternatives from which the student must choose. The supply category includes completion, short-answer, and essay items, all of which require the student to supply whatever information is requested. The advantages of selection test items are a high degree of objectivity in scoring, the capability of measuring the acquisition of large numbers of facts, ideas, or principles in a relatively short time, and convenience in the development of statistical analyses.

Supply items have a distinct advantage over selection items when the ability to express ideas or original thinking are to be measured. When properly constructed, either selection or supply items can measure learning at any level The problem-situation variety of either supply or selection test items can measure learning at the higher levels. It can aid in differentiating among students of high achievement and in estimating the degree of transfer of learning achieved by students.

The actual writing of test items is one of our most difficult tasks. We must understand the basic concepts involved. When assembling items for a test, the instructor should include a complete set of instructions. Students should know exactly what is expected of them, the relative value of test items, and time limits. Normally, test items should be arranged in order of difficulty (starting with the easiest) and grouped according to subject matter and item type.

Instructors should understand the effects of physical facilities, temperature, humidity, lighting, time allowed, and time-of-day on the reliability of test results. Similarly, they should understand the function of oral instructions preceding a test. For reliable test results, the circumstances surrounding each testing session must be consistent.

A test may be valid, reliable, and comprehensive, but, if it is not scored properly, individual scores are useless. To increase objectivity, model answers and a scoring key should be used to score a test with supply-type items. One of three basic procedures can be used to score a test with selection items. Whatever the method of scoring, students should be told specifically about the method at the time the test is administered. Obviously, if a good test is to be used effectively, scoring is a vitally important procedure.

Chapter 22

MEASURING LEARNING OUTCOMES

Introduction

An orderly process for writing sound objectives and worthwhile test items was introduced in Chapter 3, Writing Student-Centered Objectives. This approach to planning for learning outcomes, the Four-Step Process of Writing Student-Centered Objectives and Tests (Figure 22-1), produces behavioral objectives and criterion-referenced tests as required by AFM 50-2, Instructional System Development. While some of us may combine steps of this process or emphasize some steps over others, the Four-Step Process is a sound planning model for Air Force instructional objectives and tests.

The Four-Step Process for Writing Student-Centered Objectives and Tests works well for most Air Force instruction with the possible exception of wholly physical skills. The Four-Step Process will produce sound objectives for cognitive and affective learning as well as job tasks which include but are not limited to physical skills. Wholly physical skill objectives aimed at developing dexterity or manipulative tasks (touch typing, shooting a firearm, or athletic skills) might be best developed by entering the Four-Step Process at Step 3. If physical skill alone is the object of learning, it may be unnecessary to use a taxonomy (Step 1) or to sample behavioral outcomes (Step 2).

Overview and Review

Although the Four-Step Process has been illustrated at several points throughout this manual, this chapter will show additional, more complete applications. We will illustrate the process applied to a knowledge level lesson objective, a comprehension level concept, a comprehension level principle, and an application level lesson objective. Further, we will illustrate the process through which several criterion objectives and test items may be written from a single sample of behavior.

The Four-Step Process Applied to Figures 22-2 - 22-5

Each of these figures is organized to illustrate all steps of the Four-Step Process. Although the subject matter varies, each figure contains an appropriate example of the kind of information that is generated by each step in the process. The following general comments may be helpful in interpreting these figures:

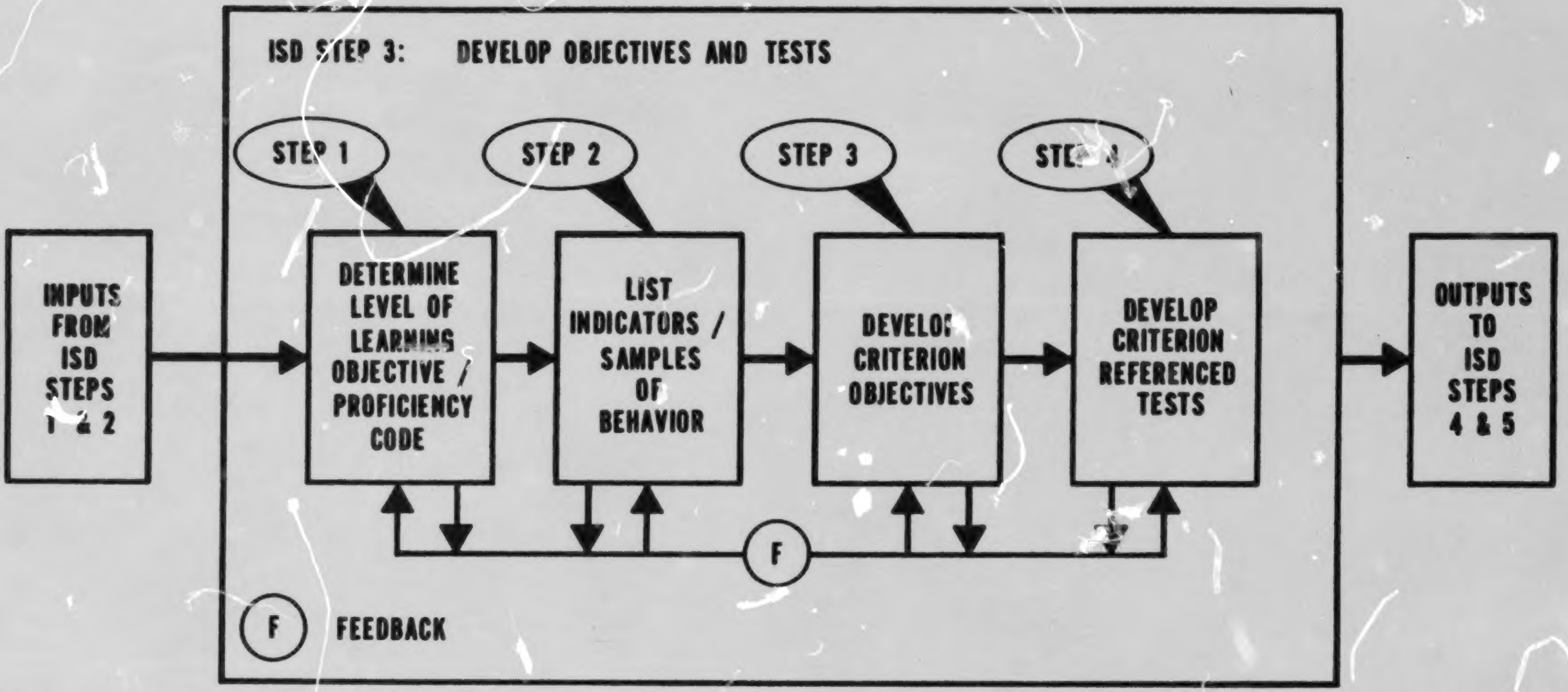
Step 1. Each figure contains an acceptable level of learning objective. Illustrations include a knowledge level objective (Figure 22-2), a comprehension-level concept objective (Figure 22-3), a comprehension-level principle objective (Figure 22-4), and an application level objective (Figure 22-5). These objectives are consistent with the instruction contained in Chapters 4, 7, 8, and 9.

Step 2. Several samples of behavior are included for each level of learning objective. There is no significance to the number or order of these samples. Nor is there any significance to the specific sample of behavior used to take the illustration on to Steps 3 and 4. Each sample could be treated in a similar way in Step 3 and several test item types could have been used in Step 4. (See Figure 22-6 for further illustration of how a single sample can generate any of several test item types.)

Step 3. These criterion objectives are rather detailed. Each is complete with the elements of conditions, performance, and standards. Some assumptions about conditions or standards might shorten these examples. In all cases, however, the criterion objective is used to bridge the gap between the sample of behavior and the test item by providing specific details about the way student behavior is to be tested.

Step 4. These criterion-referenced test items have high content validity. Each figure shows a clear trail from the level of learning objective to the test item. As products of the first 3 steps, these test items are to be used to provide evidence of the achievement of the level of learning objective. The test items measure what they are intended to measure.

FIGURE 22-1, FOUR STEP PROCESS FOR WRITING STUDENT - CENTERED OBJECTIVES AND TESTS


ISD STEP 3: DEVELOP OBJECTIVES AND TESTS
INPUTS FROM ISD STEPS 1 & 2
STEP 1
DETERMINE LEVEL OF LEARNING OBJECTIVE / PROFICIENCY CODE
STEP 2
LIST INDICATORS / SAMPLES OF BEHAVIOR
STEP 3
DEVELOP CRITERION OBJECTIVES
STEP 4
DEVELOP CRITERION REFERENCED TESTS
OUTPUTS TO ISD STEPS 4 & 5
F
F FEEDBACK

Analysis of Figure 22-2

Step 1. This knowledge level lesson is typical of many factual lessons taught for recall or recognition. The lesson might be an introduction to a larger block of instruction which would look at ISD in much more depth, or it could be a one-time lecture to make students aware of the model. In this objective, "fundamentals" is a catch all term used to save space and keep the objective relatively short. The writer of this objective could have spelled out which fundamentals (process for assessing needs, format for writing objectives, etc.), but the objective could have become so long as to be unreadable. An outline of the lesson plan would show which fundamentals were to be included in the lesson. Refer to Chapters 4 and 7 for further discussion of knowledge level objectives.

Step 2. The samples of behavior listed here describe the behavioral evidence of learning. These behaviors, and others equivalent to them, can be used to show mastery of the level of learning lesson objective (Step 1). Students may be asked to recall or recognize any of this information essentially as it was taught to them. For the purpose of illustration, Sample of Behavior #1 is carried on to Steps 3 and 4 of the process. Each of the other samples will work equally well as long as the anticipated learning outcomes are limited to recall or recognition activities. Refer to Chapters 4 and 7 for further discussion of samples of behavior and sampling knowledge level lessons.

Step 3. The sample of behavior is described in greater detail in the criterion objective. By knowing that this factual information is to be tested through true-false questions, we can write a very specific criterion objective. Although students will not be permitted to actually define ISD, they will show that they can recognize a correct definition contained in a true-false item. The criterion objective is correct in that it requires the behavior from Step 2 (defining or recognizing a definition) and the level of learning from Step 1 (knowledge or recall/recognition). Refer to Chapter 5 for further discussion of criterion objectives.

Step 4. This test item is written to the specifications of the criterion objective (Step 3). Although a true-false test item was designated in the criterion objective, several other test item types could have been used to measure this same sample (Step 2). See Figure 22-5 for an illustration of how the same sample of behavior may be used to generate several test item types. By answering this item correctly, students will be meeting the criterion objective and providing some evidence that they have reached the lesson objective (Step 1). If more evidence of mastery is needed, students may be tested on additional items which measure other behavioral samples of learning at the same level of learning (Steps 2 and 3). Refer to Chapter 21 for further discussion of writing appropriate test items.

FIGURE 22-2, The Four-Step Process Applied to a Knowledge Level Lesson

STEP 1

LEVEL OF LEARNING LESSON OBJECTIVE Know the fundamentals of the U.S. Air Force Instructional System Development (ISD) model. *

STEP 2

SAMPLES OF BEHAVIOR

1. Define Instructional System Development (ISD).
2. List the steps of the ISD process in order.
3. State the purpose for ISD.
4. Identify the number of the ISD step when given the name of the step.
5. Label each step of the ISD model when given a blank graphic.

STEP 3

CRITERION OBJECTIVE

Given the term Instructional System Development (ISD) and a statement which appears to be its correct definition according to AFM 50-2, select a true or false response to indicate whether the definition is, in fact, correct.

STEP 4

CRITERION REFERENCED TEST ITEM (True/False)

Instructional System Development (ISD) is the Air Force procedure for replacing live classroom instructors with slide and tape presentations.

T ( ) F ( )

(Key: False)

*This example could also be the first objective of a multi-objective plan which reads: know (1)the fundamentals of the U.S. Air Force Instructional System Development (ISD) model, (2) principal tools needed to deal with the model, and (3) status of the educational profession in dealing with each element of the model.

Analysis of Figure 22-3

Step 1. This objective identifies several concepts which are to be taught for understanding. The comprehension level of learning, called for in this objective, requires more than simple recall or recognition. This objective is more difficult to achieve than the knowledge level objective of Figure 22-2, because students who comprehend concepts must be able to exhibit more demanding evidence of learning. The lesson objective names three separate concepts rather than just one or two. This is neither good nor bad. It is an indication, however, that the instructor feels that the amount of time devoted to the lesson is sufficient to develop comprehension of all three concepts. Refer to Chapters 4 and 8 for further discussion of comprehension level lesson planning and concept teaching.

Step 2. Students may be asked to show their understanding of these concepts on a written test which cannot be answered by recall or recognition. Students must go beyond the facts taught to them and generalize to new and unfamiliar material. For the purpose of illustration, Sample of Behavior #2 is carried on to Steps 3 and 4 of the process. Each of the other samples will work equally well as long as the anticipated learning outcomes require students to be able to generalize on the three concepts taught. Refer to Chapters 4 and 8 for further discussion of samples of behavior and sampling concept objectives.

Step 3. The sample of behavior is described in greater detail in the criterion objective. By knowing that these concepts are to be tested through multiple-choice questions, we can write very specific criterion objectives. Although students will not be permitted to actively give new examples of the concepts, they will show that they can recognize new examples contained in a multiple-choice item. The criterion objective is correct in that it requires the behavior from Step 2 (identifying or giving new examples of the concepts) and the level of learning from Step 1 (comprehension). Refer to Chapter 5 for further discussion of criterion objectives.

Step 4. This test item is written to the specifications of the criterion objective (step 3). For whatever reasons, a multiple-choice test item was designated in the criterion objective. Several other test item types could have been used to measure this same sample (Step 2). See Figure 22-5 for an illustration of how the same sample of behavior may be used to generate several test item types. By answering this item correctly, students will be meeting the criterion objective and providing some evidence that they have reached the lesson objective (Step 1). If more evidence of mastery is needed, students may be tested on additional items which measure other behavioral samples of learning at the same level of learning (Steps 2 and 3). Refer to Chapter 21 for further discussion of writing appropriate test items.

FIGURE 22-3, The Four-Step Process Applied to a Comprehension Level Concept Lesson

STEP 1

LEVEL OF LEARNING LESSON OBJECTIVE — Comprehend the behaviorist learning theory concepts of chaining, shaping, and reinforcement.

STEP 2

SAMPLES OF BEHAVIOR

1. Define each concept.
2. Identify examples of each concept.
3. Compare the critical attributes of each concept to those of the other concepts.
4. Explain why an apparent example of any of these concepts is or is not a correct example.
5. List the critical attribute(s) missing from a scenario which would be necessary to illustrate a given concept.

STEP 3

CRITERION OBJECTIVE

Given the behavioral concepts of chaining, reinforcement, or shaping and three possible but untaught examples, one of which is correct, select the correct example.

STEP 4

CRITERION REFERENCED TEST ITEM (Multiple Choice)

An example of reinforcement is

( ) a. offering a child 50¢ to clean a room

( ) b. patting a dog on the head after performing well

( ) c. threatening to punch someone in the nose if he says another word

(Key: b)

Analysis of Figure 22-4

Step 1. This objective describes a principle in the form of a statement of relationship between two concepts (1. the style of a manager, and 2. the situational aspects of management). Other generalizations usually stated in this way include rules, laws, and regulations. This objective may be more difficult to achieve because it specifies comprehension and requires prior understanding of the two concepts involved. The relationship between the concepts is the focus of this objective. Students will be required to show evidence of their ability to translate, interpret, or extrapolate using this principle to meet the objective. Refer to Chapters 4 and 8 for further discussion of comprehension level lesson planning and the teaching of principles.

Step 2. Students may be asked to show their understanding of this principle on a written test which cannot be answered by recall or recognition. Understanding of each of the concepts is not sufficient. Students will have to provide evidence that they can go beyond the discrete concepts and generalize to new instances where the principle (relationship) is applicable. For the purpose of illustration, Samples of Behavior #1 and #5 are carried on to Steps 3 and 4 of the process. Each of the other samples will work equally well as long as the anticipated learning outcomes require the students to be able to generalize on the principle taught. Refer to Chapters 4 and 8 for further discussion of samples of behavior and sampling principle objectives.

Step 3. The sample of behavior is described in greater detail in the criterion objective. By knowing that this principle is to be tested through an essay item with a scenario, we can write very specific criterion objectives. Although a well-written multiple choice item could be used to test this sample, the essay item offers the additional advantage of being able to ask the students to explain their answer. The criterion objective is correct in that it requires the behavior from Step 2 (identifying inappropriate relationships between the concepts) and the level of learning from Step 1 (comprehension). Refer to Chapter 5 for further discussion of criterion objectives.

Step 4. This test item is written to the specifications of the criterion objective (Step 3). For whatever reasons, an essay test item was designated in the criterion objective. Several other test item types could have been used to measure this same sample (Step 2). See Figure 22-5 for an illustration of how the same sample of behavior may be used to generate several test item types. By answering this item correctly, students will be meeting the criterion objective and providing some evidence that they have reached the lesson objective (Step 1). If more evidence of mastery is needed, students may be tested on additional items which measure other behavioral samples of learning at the same level of learning (Steps 2 and 3). Refer to Chapter 21 for further discussion of writing appropriate test items, especially Figures 21-2 and 21-3 for an illustration of a scoring key for an essay item.

FIGURE 22-4, The Four-Step Process Applied to a Comprehension Level Principle Lesson

STEP 1

LEVEL OF LEARNING LESSON OBJECTIVE Comprehend that the management style of a person may need to vary from situation to situation to be most effective.

STEP 2

SAMPLES OF BEHAVIOR

1. Explain why a given situation may dictate a different management style by the same manager than another situation.
2. Describe the relationship between the various management styles and the applications for which they are considered most appropriate/inappropriate.
3. Predict probable effects of inappropriate management to specific situations.
4. Discuss the underlying assumptions to the notion of situational management styles.
5. Identify management styles which are probably inappropriate for given situations.

STEP 3

CRITERION OBJECTIVE

Given a scenario which describes a management action which is a stereotype of a managerial style, explain why the style is probably appropriate or inappropriate to the situation based upon guidelines developed in class.

STEP 4

CRITERION REFERENCED TEST ITEM

SCENARIO: Lt Col White is an experienced manager with many years of operational experience. He has two combat tours and is much decorated. His record indicates that he is considered a good manager. His management experiences include supervising large numbers of enlisted persons and junior officers as well as clerical and technical civilians. He has recently been assigned to manage a small unit of professional civilians engaged in very advanced thinking weapons research. As he prepares to assume his command, Lt Col White concludes that he probably ought to stick with the management style that got him where he is today. He is somewhat authoritarian but has always been respected by his subordinates. He feels comfortable with this style, he has been successful with it in the past, and sees his management skills as being highly transferrable from situation to situation.

TEST ITEM: (Essay) Is Lt Col White likely to encounter a problem when he brings his previously successful management style to the new situation? Why or why not? Explain your position in about a page of analyses. While spelling, grammar, etc., are not to be counted, serious writing errors may affect the readability of your overall answer.

Analysis of Figure 22-5

Step 1. This objective demands a much higher level of understanding than any of the previous examples. To select and apply a decision making model in this objective, students must already know a great number of facts and understand several concepts and principles. Because of the nature and complexity of the task, the objective is at the application level of learning. Students who are able to correctly apply a management model are functioning with a good deal of understanding. Refer to Chapters 4 and 9 for further discussion of application level lesson planning.

Step 2. Answering a question about the concepts and principles at work in this model is not a sufficient indicator of learning. To satisfy this objective, students must actually select and apply a model to a decision-making situation. They must be able to put into practice what they appear to understand in theory. For the purpose of illustration, Sample of Behavior #1 is carried on to Steps 3 and 4 of the process. Each of the other samples will work equally well as long as the anticipated learning outcomes require the students to be able to apply the model taught. Refer to Chapters 4 and 9 for further discussion of samples of behavior and sampling application level objectives.

Step 3. The sample of behavior is described in greater detail in the criterion objective. By knowing that this behavior is to be tested through an essay item with a scenario, we can write very specific--but meaningful--criterion objectives. Although a well-written multiple choice item could be used to test this sample, the essay item offers the additional advantage of being able to ask the students to explain their answers. The criterion objective is correct in that it requires the behavior from Step 2 (solving a problem using a model) and the level of learning from Step 1 (application). Refer to Chapter 5 for further discussion of criterion objectives.

Step 4. This test item is written to the specifications of the criterion objective (Step 3). For whatever reasons, an essay test item was designated in the criterion objective. Several other test item types could have been used to measure this same sample (Step 2). See Figure 22-5 for an illustration of how the same sample of behavior may be used to generate several test item types. By answering this item correctly, students will be meeting the criterion objective and providing some evidence that they have reached the lesson objective (Step 1). If more evidence of mastery is needed, students may be tested on additional items which measure other behavioral samples of learning at the same level of learning (Steps 2 and 3). Refer to Chapter 21 for further discussion of writing appropriate test items, especially Figures 21-2 and 21-3 for an illustration of a scoring key for an essay item.

FIGURE 22-5, The Four-Step Process Applied to an Application Level Lesson

STEP 1

LEVEL OF LEARNING LESSON OBJECTIVE Apply a decision-making model to solve common Air Force management problems.

STEP 2

SAMPLES OF BEHAVIOR

1. Solve selected management problems for which a decision-making model is considered appropriate.
2. Explain why a selected management problem is not an appropriate application for a particular decision-making model after recognizing that it is not appropriate from an inspection of a case-study type scenario.
3. Determine whether the solution to a real or hypothetical Air Force management problem is consistent with a solution derived from applying a decision-making model and explain any differences in the solutions in terms of the processes used to generate them.
4. After determining that the proposed solution to a given management problem is inconsistent with a model, estimate the consequences to the organization as a result of the shortcomings in the proposed solutions.

STEP 3

CRITERION OBJECTIVE

Given an Air Force management problem involving the ineffective or inefficient use of human resources, generate at least two alternative solutions which show the correct application of a decision-making model; in addition to the acceptable alternatives, students must show reasonable evidence of the correct application of each of the steps of the model to the specific management problem.

STEP 4

CRITERION REFERENCED TEST ITEM

SCENARIO: The student would be provided with an appropriate scenario involving the ineffective or inefficient use of Air Force human resources such as the "Too Busy to Manage" case contained in the first lesson plan in Chapter 15.

TEST ITEM: Select and use an appropriate decision-making model to generate at least two alternative solutions to this problem. Write down your thoughts as you go through each step in the process. There will be no penalty for errors in spelling, grammar, etc., unless they interfere with the ability to understand what you have written. Your alternative solutions and your thought processes will be evaluated in terms of the model you have selected and used as we have interpreted it in class. There are no "school solutions" to this problem, but you must provide sufficient evidence to support your selection and use of the model.

Analysis of Figure 22-6

1. In general, the analysis of Figure 22-3 applies to this figure as well. This is another example of a lesson in which several concepts are to be taught then tested. These concepts happen to be philosophical theories as they relate to education. This general objective format applies equally well to several alternative theories of management, different doctrines of strategy and tactics, or alternative concepts of leadership.

2. This figure is unique from the previous examples in that it illustrates how the same sample of behavior (Step 2) can generate several alternative criterion objectives and test items. The critical behavior in this sample is to "predict." Whether the students let us know of their predictions by circling, checking, matching, filling in, or writing them out is not important. The sample of behavior is particularly valuable to the student as a study guide if we change test item fromats from time to time, or if we intend to test the same behavior with more than one item type.

Each of the samples in all five illustrations (Figures 22-2 through 22-6) could be developed into the whole range of test items in the same way as shown for this one sample. We must again realize that the significant student behaviors for this objective include define, identify, compare, predict, and list. The actual student behaviors required to complete the answer to the test item, select, match, and write, are of practically no consequence. This illustration should further emphasize the importance of well-stated and appropriate samples of behavior. Again, regardless of the test item type, the ability to predict is what is important about the several test item examples in Figure 22-6.

FIGURE 22-6, The Four-Step Process Applied to a Comprehension Level Concept Lesson Showing Several Test Item Types Generated by the Same Sample of Behavior

Step 1

LEVEL OF LEARNING LESSON OBJECTIVE Comprehend the concepts of Perrenialism, Essentialism, Progressivism, and Reconstructionism as they relate to education.

SCENARIO: All questions below are based on the following scenario: Audiovisual Specialists do not need to know geometry or trigonometry to do their jobs. The Audiovisual Specialist course director, Captain Kline, believes that all personnel should take geometry and trigonometry to increase their mental faculties. He has prepared a course proposal to submit to the school's curriculum committee.

Step 2

SAMPLES OF BEHAVIOR

1. Define each concept.
2. Identify examples of each concept.
3. Compare the critical attributes of each concept.
4. Predict the reaction of a person identified with each of the concepts to a specific educational issue or innovation.
5. List the critical attributes missing from a scenario which would be necessary to illustrate a given concept.

Step 3

CRITERION OBJECTIVE (For True/False Test Item)

Given a scenario which contains the essential elements of information for predicting the reaction to a specific educational issue or innovation by an Essentialist, Perennialist, Progressivist, and Reconstructionist and a prediction, select a true or false response, to indicate whether the prediction is, in fact, correct.

Step 4

CRITERION REFERENCED TEST ITEM (True/False)

The curriculum committee, with a past voting record which is clearly Perrenialist in nature, will probably support the proposal to require all audiovisual specialists to take geometry and trigonometry.

T ( ) F ( )

Step 3

CRITERION OBJECTIVE (For Matching Test Item)

Given (1) a scenario which describes a situation involving a specific educational issue or innovation, (2) a list of the educational philosophies identified in AI-620, and (3) a three alternative response which predicts the reaction of these philosophies to the specific issue, match the educational philosophy and the logical prediction correctly.

Step 4

CRITERION REFERENCED TEST ITEM (Matching)

Match the predicted responses to the situation described in the scenario in Column B with the major schools of educational philosophy listed in Column A by placing the appropriate letter in the space provided. Each of the responses may be used once, more than once, or not at all.

Column A Philosophy	Column B Responses
( ) 1. Essentialism	a. "Yes, require all students to take these subjects."
( ) 2. Perennialism	
( ) 3. Progressivism	b. "No, students should not be required to take these subjects."
( ) 4. Reconstructionism	c. There is insufficient information given to predict the reaction of a committee with this educational philosophy.

Step 3

CRITERION OBJECTIVE (For Multiple Choice Test Item)

Given a scenario which contains a specific educational issue or innovation and three alternative predictions for the reaction of one of the major schools of educational philosophy according to AI-620, select the most logical prediction.

Step 4

CRITERION REFERENCED TEST ITEM (Multiple Choice)

From the situation described in the scenario, predict the vote of the curriculum committee:

( ) a. A committee with a Perrenialist philosophy of education will support the proposal.

( ) b. A committee with a Perrenialist philosophy of education will not support the proposal.

( ) c. There is insufficient information in the scenario to make a prediction.

Step 3

CRITERION OBJECTIVE (For Completion/Fill-in Test Item)

Given a prediction of one of the major schools of philosophy to a specific educational issue or innovation contained in a scenario but which is incomplete or has words omitted, write in the words necessary to complete or fill in the prediction correctly.

Step 4

CRITERION REFERENCED TEST ITEM (Completion/Fill-in)

In the situation described above, the vote of the curriculum committee with a Perrenialist philosophy will be _______________.

Step 3

CRITERION OBJECTIVE (For Short Answer/Essay Test Item)

Given a scenario which describes a situation involving a specific educational issue or innovation and a list of the educational philosophies, correctly predict the reaction of each to the situation described.

Step 4

CRITERION REFERENCED TEST ITEM (Short Answer/Essay)

What will be the vote of a curriculum committee in the situation described above if the committee is clearly:

(1) Essentialist

(2) Perennialist

(3) Progressivist

(4) Reconstructionist

Summary

The Four-Step Process for Writing Student-Centered Objectives and Tests is a valuable planning tool. Almost all cognitive and affective objectives lend themselves well to this treatment as do many complex tasks involving psychomotor skills. We may combine, skip, or rearrange these steps, but they will generally work best when done as described and in order.

General objectives which specify a level of learning in some acceptable taxonomy give us a starting point (Step 1). We then name the samples of behavior which we will accept as evidence of learning (Step 2). By adding details about the testing situation, such as conditions and standards, we can further clarify the behavioral outcomes of learning by writing criterion objectives (Step 3). Test items are then written to specification and provide us with the evidence of learning we said we would accept (Step 4).

In addition to Figures 22-2 through 22-6 which illustrate the application of the Four-Step Process, additional whole or part illustrations of the process can be found at various points throughout this manual:

- Chapter 3. An illustration of all four steps of the process applied to a lesson objective on leadership.

- Chapter 4. A partial illustration of the process emphasizing Steps 1 and 2.

- Chapter 5. A partial illustration of the process emphasizing Step 3 as it builds upon Steps 1 and 2.

- Chapters 7-9. Considerable detail on Steps 1 and 2 of the process at the various levels of the cognitive domain.

- Chapter 10. An introduction to the way in which the process may be applied to the affective domain; includes a sample lesson plan which illustrates the Four-Step Process.

- Chapter 13. Includes 3 sample lecture lesson plans (knowledge and comprehension level) which illustrate the Four-Step Process.

- Chapter 14. Includes a sample guided discussion lesson plan (comprehension level) which illustrates the Four-Step Process.

- Chapter 15. Includes 2 sample case study lesson plans (comprehension and application level) which illustrate the Four-Step Process.

- Chapter 16. Includes a sample teaching interview lesson plan (comprehension level) which illustrates the Four-Step Process.

- Chapter 17. Includes 2 sample demonstration-performance lesson plans (knowledge and comprehension level) which illustrate an alternative way to use the process when one behavioral outcome is being emphasized to the exclusion of other samples of behavior (see Figures 5-4, 5-6, and 5-10 for further explanation of this shortened and limited-use version of the Four-Step Process).

- Chapter 21. A partial treatment of the process emphasizing Steps 3 and 4

Chapter 23

EVALUATION BY RATING

When we evaluate student performance and traits, instructor observation and judgment are often the only satisfactory bases for evaluation. A paper-and-pencil test can measure understanding of administrative procedure, but we must exercise judgment to determine how well procedures are administered. It is possible to devise examination items to determine a supervisor's understanding of management principles, but we need judgment to determine how well the person actually applies those principles on the job.

Rating instruments should be valid and reliable. Rating instruments are valid when they measure the trait of ability they are supposed to measure. Instructor ratings are reliable when they measure traits or abilities consistently.

We determine the validity of a rating and supporting rating instruments in much the same way as we determine the validity for any measurement of learning. We may need to establish content, concurrent, or predictive validity for a rating instrument. Validity is the most important characteristic of rating instruments as well as other measures of learning. Refer to the section on validity in Chapter 24 for a further discussion of ways to establish validity.

The reliability of ratings is not difficult to determine. If we are rating supervisors on their ability to manage, we ask a number of qualified people to observe the performance and rate the supervisor. The extent to which the observers agree on the ability being rated is a measure of reliability. If the observers are in complete agreement, we can consider the rating highly reliable.

Rarely will several people agree perfectly on the adjective describing the exact quality of a performance. Two observers who agree on the high quality of a performance may use different words to describe it in the rating. For example, in Figure 23-1, one observer might describe a performance as "Excellent" and the other describe the same performance as "Superior." Each may be trying to say the same thing in different words.

( ) SUPERIOR
( ) EXCELLENT
( ) GOOD
( ) FAIR
( ) UNSATISFACTORY

Figure 23-1. Sample Adjective Checklist for Rating Student Performance

To avoid the apparent unreliability that arises from semantic difficulties, the instructor may use a scale that has numbers instead of words (Figure 23-2). Observers using this scale to rate a performer on ability to drive a car might circle 9, if they thought the car was driven in the best possible manner; 1, if in the worst possible manner; 5, if average; and so. Simple numerical scales of this sort, however, may provide observers with too meager a frame of reference. Numbers, such as the circled 3 in Figure 23-2, may mean the same things to observers as the words did in the previous example. Numbers do have the advantage of appearing to be equally spaced, easier to rank, and easier to tabulate.

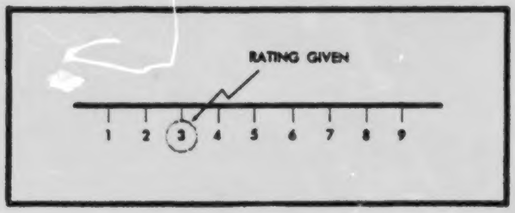


Figure 23-2. Sample Numerical Scale for Rating Student Performance

RATING METHODS

For the purpose of rating student performance, the instructor must assign an absolute value to the trait, performance, or ability of a student without reference to the performance or ability of any other student. In effect, the instructor rates the person, trait, or performance according to a fixed scale. Our instructional objectives specify the scale to be used in the rating and the fixed point at which the rated performance is acceptable. Regardless of the number of points on a rating scale, we should divide the scale at some point into acceptable and unacceptable zones. Gradations within those zones are indications of how acceptable or unacceptable the instructor rated the performance when compared to the standard. The acceptable and unacceptable data from these ratings can be analyzed in the same criterion-referenced way as other test data. See Chapter 24, Criterion Referenced Analysis.

Numerical Scale

The simplest form of rating scale is the numerical scale. Any number of points on the scale are feasible, but an odd number is commonly used so that the center figure can stand for average or passing. The number of points on the scale should depend upon the number of differentiations required and upon the ability of instructors to differentiate.

Most instructors are able to make at least five differentiations, which break a group into those who far exceed standards, slightly exceed standards, meet standards, fall slightly below standards, and fall far below standards. Few trained instructors can reliably make more than nine differentiations. As a result, most rating scales contain five to nine points.

Descriptive Scale

The descriptive scale uses phrases to indicate levels of ability. Figure 23-3 shows a descriptive scale for rating pilot ability. Five levels of ability are described. Such a scale is more versatile than the numerical scale because the degrees of excellence can be varied to suit the occasion. For example, suppose an instructor wants to evaluate a particular student trait. He or she feels that all the students are notably satisfactory, but the course instructor wants to know to what degree each is better than satisfactory. A numerical scale might be useful, except for the common impression that the lowest numbers on the scale indicate very inferior performance. By using a descriptive scale, like the one shown in Figure 23-3, the instructor has a better frame of reference. Here only the lowest rating possible is labeled unacceptable. All other ratings indicate degrees of acceptability. If we had used a numerical scale in this instance, instructors might have tended to shift ratings to the high end of the scale.

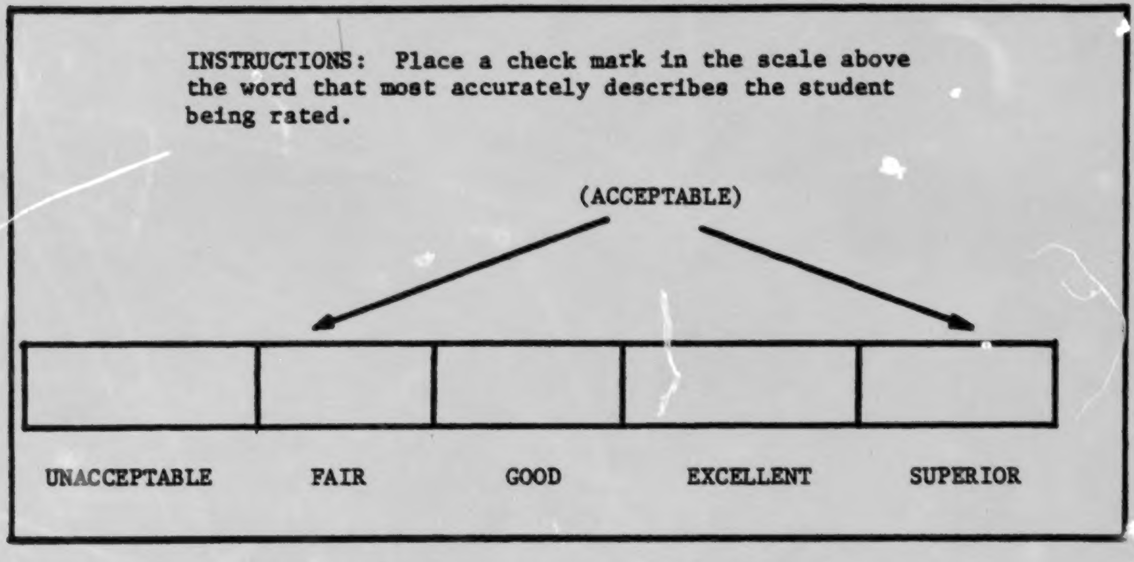

INSTRUCTIONS: Place a check mark in the scale above the word that most accurately describes the student being rated.

Figure 23-3. Descriptive Scale for Rating Student Performance

A good choice of descriptive phrases helps to reduce rating errors. If instructors do not use extreme descriptions, the categories at the end of the scale are less objectionable.

The major disadvantage of the use of descriptive scales is a semantic one. An "excellent" problem solver does not mean the same thing to all instructors. Another disadvantage is the difficulty in selecting phrases which describe degrees of performance that are equally spaced. When the scale shown in Figure 23-3 is used, most people feel that there is less distance between "excellent" and "superior," than between "fair" and "good." Well written instructional objectives with clearly defined standards for each point on the scale can help to lessen this problem.

Graphic Scale

The graphic scale is a combination of the numerical and descriptive scales. Besides a numerical scale, various adjectives or phrases are set below a continuous horizontal line, which represents the range of the ability or trait being measured. In using the graphic scale, the instructor must consider the numerical range of the scale, the phrases which describe the various positions on the scale, and the point on the scale which is used to separate acceptable from unacceptable performance.

Three typical forms of the graphic scale are shown in Figure 23-4. In Example A, the instructor is given instructions for judging the energy level of students. The instructor is instructed to mark the scale after considering energy and application to duties, day in and day out. These instructions help reduce rating errors and encourage instructors to consider the same things about each student.

Example B in Figure 23-4 shows a graphic scale in which certain types of behavior are described for each point on the scale. With most scales, the instructor must not only observe but also evaluate to form a rating. People can observe more accurately than they can evaluate what they have observed. The difficulty of evaluation increases errors of rating. Whenever ratings can be based on observations alone, reliability is greatly improved. With the scale in Example B, the instructor is required only to record, not evaluate, the actions of the person being rated. Hence, this type of graphic scale incorporates much objectivity. If a trained instructor observes accurately and records honestly in using this scale, most rating errors should be eliminated. In preparing this type of scale, the instructor must make sure that the behavior described for each point is actually an improvement over that for the point just below it. In each case, distances between the points should appear to be about equal.

The scale in Example C is similar to that in B except that descriptive phrases are not provided for all points on the scale. In some respects this is an improvement. Many times instructors feel that the rating should fall somewhere between two points. Such a rating is possible with this form of the graphic scale. The fuller descriptions in Example C increase the likelihood that observed behavior can be pin-pointed on the scale. Generally speaking, the more detailed the descriptions, the better the rating results. At some point, however, the descriptions may be too long to print directly on the rating form. At that point, brief descriptors may be used as reminders of the more detailed descriptions published elsewhere.

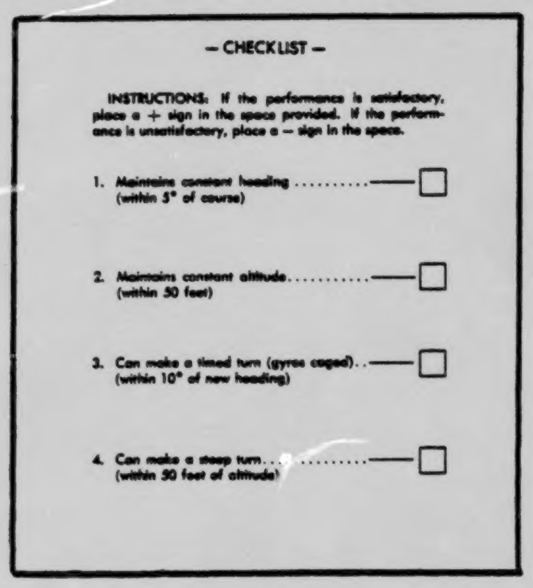
	UNSATISFACTORY		SATISFACTORY		
Example A **Industry:** Consider energy and application to duties day in and day out.	1 Lazy	2 Indifferent	3 Diligent	4 Energetic	5 Untiring
Example B **Cooperation:** Demonstration of willingness to work with others.	1 Creates friction.	2 Indifferent to others.	3 Gets along with most people.	4 A harmonious team worker.	5 Actively promotes harmony in working with others.
Example C **Initiative:** Action taken on own responsibility.	1 Slow to act, even when a decision is much needed. Waits for others. Lets opportunities pass. Does not volunteer. Reticent.	2	3 Takes needed action without delay. Volunteers for some tasks. Undertakes all routine jobs without supervision. Dependable.	4	5 Anticipates needs. Works ahead and prepares for possibilities. Actively seeks opportunities. Eager.

Figure 23-4. Examples of Typical Forms of the Graphic Scale

Checklist

The checklist is sometimes considered a separate rating method, but actually it is a two-point rating scale. A checklist is useful for rating ability to perform a set procedure. It is also a simple method of rating skills when the purpose is to determine whether students have reached a certain minimum level without regard to degrees of acceptable or unacceptable performance. Figure 23-5 shows a position of a checklist which might be used for rating instrument flying proficiency. In using the scale, the instructor indicates whether the completion of each step was satisfactory or unsatisfactory. Breaking a performance into many observable elements eliminates or reduces many rating errors.

Reliability is usually high in checklist rating because of the go/no go nature of the decisions required. For example, if apples are to be sorted into a hundred different categories ranging from rotten to top quality, the possibilities of error would be enormous. If the categories are reduced to rotten, partially rotten, fair, good, and excellent, the number of possible errors is greatly reduced. Fewer choices require fewer and less refined judgments. When the number of choices is reduced to two, rotten or sound, the chance for either error or bias is still further reduced, and reliability and objectivity improve correspondingly. Because of its many broad differentiations, the checklist is comparatively reliable.



— CHECKLIST —

INSTRUCTIONS: If the performance is satisfactory, place a + sign in the space provided. If the performance is unsatisfactory, place a – sign in the space.

1. Maintains constant heading ....—— ☐
(within 5° of course)

2. Maintains constant altitude..........—— ☐
(within 50 feet)

3. Can make a timed turn (gyros caged)..—— ☐
(within 10° of new heading)

4. Can make a steep turn...........—— ☐
(within 50 feet of altitude)

Figure 23-5. Checklist for Rating Proficiency in Instrument Flying

On the debit side, however, only a limited amount of information can be obtained from a checklist. For example, the checklist in Figure 23-5 does not indicate how far above or below standard the satisfactory pilot performed each maneuver. For purposes of an instrument check, the information obtained would be sufficient to determine whether each pilot has reached a certain minimum level of proficiency but little else.

Product Scale

At times, we rate the tangible product of a performance, rather than the performance itself. Figure 23-6 shows a product scale for rating the ability to fly an instrument trainer. We require the pilots being tested to fly a pattern which corresponds to the pattern shown at A. At the completion of the exercise, we compare the pattern produced to the patterns on the scale.

If followed carefully, this procedure can eliminate nearly all rating errors. The scale provides a tangible standard which a rater can use to measure the product. Product scales tend to reduce or eliminate most rater errors.

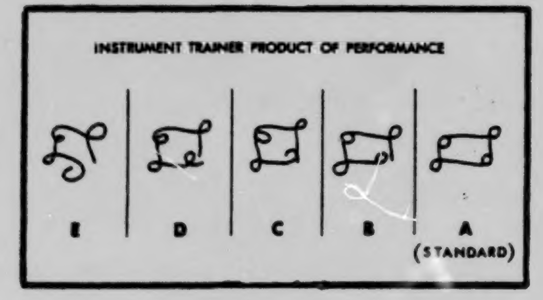


Figure 23-6. Product Scale for Rating Ability to Fly Instrument Trainer

Forced Choice

Another approach to performance rating is the forced-choice technique which uses two to five descriptions of behavior in each block. Both favorable and unfavorable statements may be included in a block. Most rating instruments contain 25 to 30 blocks. Figure 23-7 shows a single block containing four descriptions--two favorable and two unfavorable. The rater is asked to select the statement that is most characteristic and the one that is least characteristic. Although the favorable and unfavorable statements are easily distinguished, the rater does not know whether A or B receives more credit.

The decision is so precise that the observers are usually forced to ignore their general impression and think back to specific instances of behavior. Because the rater reports behavior without being permitted to judge the quality of the behavior, reliability is greatly improved.

An objection to the forced-choice technique is that considerable research is necessary to produce a scale for any given purpose and to devise a fair method of keying the responses. For example, before the scale is constructed, items that are known to differentiate between good and poor performances are paired with items that do not differentiate. Both items in the pair must be shown to have approximately equal appeal to the rater. Because of such factors, instructors seldom try to construct forced-choice rating scales.

	Most characteristic	*Least characteristic*
A. Can take over in an emergency	☑	☐
B. Fair and just in dealings with others	☐	☐
C. Lacks interest in job	☐	☐
D. Questions orders from supervisors	☐	☑

Figure 23-7. Single Block of Forced-Choice Instrument

Other Rating Scales

The scales which have been described so far are probably the most common. Except for the forced-choice, most of the scales considered (or variations of them) can be designed by classroom instructors. Naturally, they should be constructed carefully to serve specific purposes and keyed to carefully written instructional objectives.

Other, more sophisticated types of rating scales are normally developed only by experts:

Sociometric techniques allow individuals to rate themselves or rate others according to their performance in a group. Some sociometric techniques are useful to evaluate social traits and attitudes. Others can be applied in the classroom to judge the amount or quality of participation by students in projects and discussions. Some techniques employ diagrams, often called sociograms, which are easy for an instructor to use.

Q-techniques, a type of rank order scaling, rate traits as well as performances of students and teachers. Often the rater sorts and scores a predetermined set of descriptive terms or makes a selection of terms after a specific period of observation.

The semantic differential scale depends upon key words with opposite meanings. The words are placed at opposite ends of a line with numbers representing a spectrum of values, in this manner:

autocratic 1 2 3 4 5 6 7 8 *democratic*

Surprising success has been reported by researchers working with such scales.

Self-anchoring scales, which use the rater's opinion as a point of departure, are frequently written for self-evaluation. One might begin: "Here are the numbers 1 through 10. Let 1 represent the untrained beginning instructor, and let 10 represent the ideal master instructor. Now circle the number which you feel best represents your ability level as an instructor today." From this point, instructors can estimate their ability in the past and future or even estimate the abilities of others.

It is possible but quite difficult to use these more sophisticated rating scales in a criterion-referenced situation. Generally speaking, better data for criterion-referenced testing is obtained through numerical scales, descriptive scales, graphic scales, checklists, and product scales.

CONSTRUCTING THE RATING DEVICE

The process for constructing a rating instrument involves certain general steps which will naturally vary according to the type of scale being made. In all cases, however, the type of rating scale to be used is dictated by the performance or trait to be measured as described in the instructional objective.

Determine Objective and Purpose

The initial step is the same as that for constructing any other measuring instrument: to determine the objective and carefully define it in terms of observable behavior. See Chapter 3, Writing Student-Centered Objectives. An objective may be to determine a student's effectiveness in a particular skill, to evaluate the level of achievement in performing a complex task, or to predict the proficiency in applying what has been learned. After the objective has been clearly defined, the task is to determine not only what to evaluate (the objective), but also why the evaluation is to be made (the purpose).

Select Traits or Factors

This step requires careful consideration of the job which the subject is now, or will be, doing. In the light of the objective and purpose of the rating, what traits or factors determine the success or failure of the person being rated?

Selected traits or factors must be critical, observable, distinguishable, specific, differentiating, and limited in number.

- Select only traits or factors that are critical or essential to the person's success. If promptness is not a trait that must be considered to determine a degree of proficiency, do not include it. On the other hand, if it is essential and an objective of your course, it must be included to make the rating valid. The fact that a trait is highly important or desirable in a rating is no guarantee that it is essential.

- Select traits or factors that are observable. Ratings must be based on what instructors can see, rather than on their interpretation of the situation. Base the rating upon an eyewitness report, rather than upon circumstantial evidence.

- Select traits or factors that are distinguishable. If the traits are so closely related that a rating on one ensures a similar rating on the other, logical error and loss of comprehensiveness will lower the validity of the rating.

- Select traits or factors that can be defined in terms which have the same meaning for all instructors.

- Select traits or factors that are specific and definite, rather than vague or general in nature.

After studying the traits that seem to meet the criteria, eliminate those which do not differentiate. If all people possess the trait and all who possess it have it to the same degree or level, it can serve no useful purpose in the rating scale.

The number of traits may vary from four to ten. Fewer than four rarely provide an adequate sampling--that is, there are nearly always at least four appropriate, critical factors in a human performance of any kind. More than ten traits usually tend to overlap. At any rate, instructors will be overburdened if they are expected to watch for too many factors. Accurate observations of a critical sampling are superior to sporadic observations of a bulky list of traits.

Define Traits

The traits or factors selected must be clearly and accurately defined in terms of observable behavior which is pertinent to the situation. Definitions should show what students do rather than how well they do. For example, voice (as used by a drill instructor) might be appropriately defined as "volume and clarity in giving commands." Such comments as "Uses voice well," or "An able and effective communicator," are inadequate. The first gives no guidance as to what is to be considered under voice and the second is, in itself, an evaluation.

Determine Degrees of Success

The levels of performance should relate to the purpose of the evaluation and the instructor's ability to differentiate. If the purpose of the rating is to identify only three groups--poor, average, and good--there is no justification for using a five point scale. If the nature of the evaluation is such that

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SAMPLE
IMPROVED TEST ITEM MANAGEMENT (ITIM) PROGRAM

A. This plan will implement the ITIM program as approved by the curriculum committee. The program will eliminate test items or their content which are unacceptable based on an analysis of ease indexes. Unacceptable test items are:

1. Pre-test items which have been answered correctly by 50% or more of the incoming students (often expressed as an ease index greater than .49 or EI $>$.49).

2. Post-test items which have been answered correctly by less than 80% of the graduating students (EI$<$.80) for three consecutive classes.

B. Probable causes for unacceptable test items include:

1. Poorly defined or articulated objective

2. Poor or improper test item construction

    (1) Errors in the mechanics of item writing

    (2) Invalid test items

3. Inappropriate content

    (1) Content taught at a level too high (students lack prerequisites) or too low (students have already mastered objectives) for the stated objective or poorly taught at the school.

    (2) Properly taught content, but objectives written at a level too high or low for the student body.

4. Lack of student motivation to perform well.

C. Procedure for Improving or Removing Unacceptable Test

Items/Content

1. Gather data. Within a reasonable time after each class, the evaluation section will secure a computer analysis of pre- and post-test item data which will provide the percentage of students who correctly answered each item.

2. Measure against criteria. Test items which are unacceptable when compared to the criteria above will be noted in a report. A copy of this report will be retained by evaluation and another copy will be routed to the members of the curriculum committee.

3. Improve unacceptable test items/content.

    a. Carefully assess statement of instructional objective

- Note variations in ratings and determine the cause. The most common causes of variations are poor definition of traits, inadequate description of levels of performance, and improper weighting. See Chapter 20, Introduction to Evaluation, and Chapter 24, Criterion Referenced Analysis.

Validation of the rating scale is a continuous process. If the instructor does not analyze, critique, and improve the rating instrument, it will not serve its intended purpose.

COMMON RATING ERRORS

Instructors may differ in their ratings whenever scales are used to record observations and judgments of quality. These differences are often called rating errors. Numerous attempts have been made to identify and categorize the errors that occur when rating scales are used. Some errors appear to be caused by the design of the scale, some occur only with certain groups of observers, and some with individual observers. Some observers are subject to errors when rating all persons, some when rating certain groups, and some when rating only certain individuals. Other errors occur only when certain traits or attributes of students are rated.

Errors can be classified into four broad groups: (1) error of central tendency, (2) error of standards, (3) error of halo, and (4) logical error. The first two kinds of errors, central tendency and standards, affect all students rated by an instructor who is subject to either of the errors. The third type of error, halo, affects only certain students within a group. The fourth, logical error, appears only when two or more traits of students are being rated. These common errors may all be reduced, and some may be eliminated, through the training of instructors and the careful design of a rating scale.

Error of Central Tendency

Many instructors hesitate to give either extremely good or extremely bad ratings and tend to group their ratings close to the center of the scale. Central tendency occurs most commonly with inexperienced instructors. Even with experienced instructors, this error may appear when rating personal qualities or abilities that are difficult to identify, such as teaching ability or personality. An analysis of a number of ratings made by a single instructor may reveal the error of central tendency. Using a nine-point scale, an observer made 100 ratings of administrative ability all of which were either 4, 5, or 6 (Figure 23-9). In a sample of 100 people, it could be assumed that administrative ability would vary more and that the observer made an error of central tendency.

Some observers place too many ratings at the extremes and too few near the center of the scale, but this tendency is rare. Although the error is the opposite of central tendency, it may be considered in that category.

Error of Standards

Some instructors tend to overrate or underrate because of the differences in their standards. Standards of physical measurement are fixed units--inches, centimeters, ounces, and grams. But in rating with only mental standards for comparison, there may be as many different standards as individual instructors.

Well-trained and experienced instructors usually distribute their ratings similarly. This agreement in ratings usually indicates that similar standards are used. Inexperienced and untrained instructors are less likely to have similar distributions.

the rater can identify or distinguish between only two levels of performance, a scale of seven or more levels of attainment would be inappropriate.

Rating scales used for criterion-referenced measurement should have an understood or labeled point to distinguish acceptable from unacceptable ratings. This distinction is necessary regardless of the number of points on the rating scale used to grade levels of acceptability and unacceptability.

Describe Degrees of Success

Each degree of success or level of performance in each trait or factor should be described in terms of observable behavior. These word pictures indicate how well the person performs. Quality of performance rather than frequency should be stressed.

Assign Weights

Determine how important each factor is and weight it accordingly. It is possible that all factors are not of equal importance. For example, a rating system for two duty assignments, one administrative and the other technical, might look like Figure 23-8.

		POINT VALUE	
		Administrative	Technical
I	Job Knowledge	15	10
II	Cooperation	20	10
III	Judgment	20	20
IV	Personal responsibility	20	10
V	Leadership	15	10
VI	Growth potential	5	35

Figure 23-8. Relative Weights of Performance Factors

The weight given each factor can be determined by pooling the opinions of several persons thoroughly familiar with the situation and specified in the instructional objective or supporting documents. These weights should be examined after the scale has been used. Then it will be possible to determine if the ratings actually differentiate between those who are effective on the job and those who are ineffective.

Validate

A validation study is a method or procedure used to examine, review, and improve the rating instrument itself. In the validation of a rating scale, the following considerations are important:

- Base the study on a significant number of cases, normally 50 to 100. With small groups, it may be necessary to use the scale several times before attempting to validate it.

- In order to determine the reactions of raters, compare the ratings of one individual made by several raters, as well as the ratings of several individuals made by a number of raters.

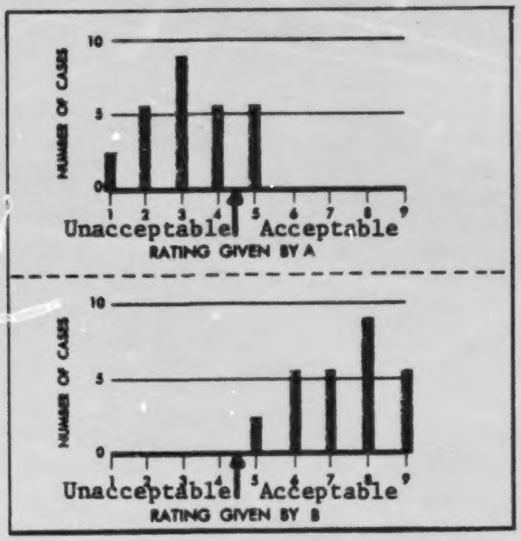


Figure 23-10. Error of Standards
(Ratings by Two Observers)

error of halo. If instructors are favorably impressed, they may rate students too high. If they are unfavorably impressed, the shift is toward the low end of the scale. It should be noted that halo error can be either favorable or unfavorable, and that it may affect only certain persons being rated.

Halo error can be traced to the likes, dislikes, opinions, prejudices, and moods of raters. When considering friends or close acquaintances, instructors may tend to give undeservedly high ratings on all favorable traits. Such a halo error is often called error of leniency.

Some people believe that close-set eyes show dishonesty. An instructor who holds this belief is likely to be affected by it when rating a student with close-set eyes. Some people have preconceived concepts about certain racial groups. They may believe that one group is industrious, another thrifty, yet another excitable. Others have an aversion to or a special liking for religious groups. All these preconceptions may influence instructors. When halo error is traced to such sources, it is sometimes called error of stereotype.

Jones and nine other instructors simultaneously rated six persons on teaching ability. In Figure 23-11, all ten instructors agreed reasonably well on the teaching ability of five of the six persons rated. All but Jones agreed on the teaching ability of the sixth (E). Apparently Jones allowed some general impression regarding E to influence the rating unduly.

The error of halo may be suspected in some situations, but frequently goes undetected. Halo errors can be positively identified only when many competent and experienced instructors rate a number of persons under identical conditions. Usually only extreme cases are detected, even under controlled conditions. The

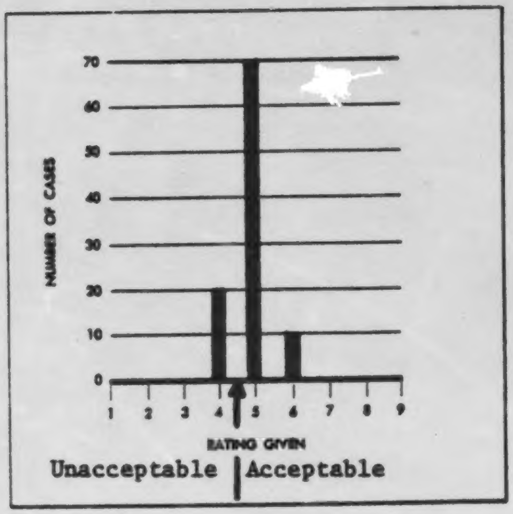


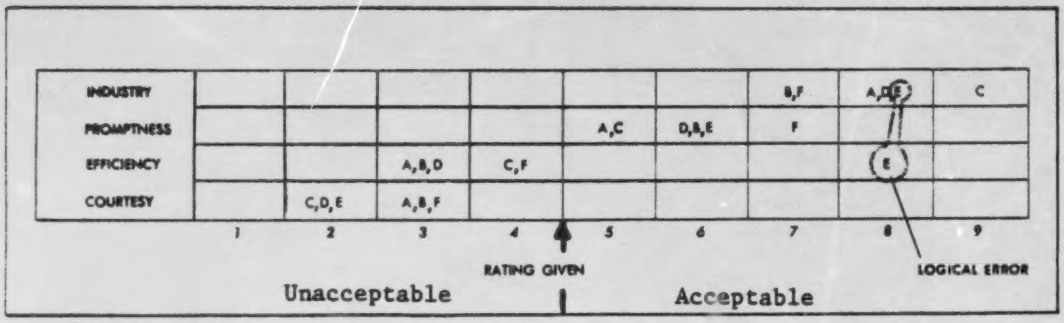
Figure 23-9 Error of Central Tendency (Rating by One Observer)

Thirty persons, representing an average group, were simultaneously rated on a single trait by instructors A and B who had different interpretations of the standards of acceptability for that trait. The differences in standard are reflected by the ratings in Figure 23-10. If A and B were to rate an additional group of thirty persons, their standards should probably be more nearly alike. As A and B receive more training and gain experience in rating this trait, their distributions should tend to agree more closely, particularly as they relate to the point of acceptable or unacceptable behavior.

If instructors A and B were already experienced raters, it would appear that A has a strict interpretation of the standards and B has a lenient interpretation. If experienced instructors have consistent, yet quite different interpretations of standards, training should reduce the differences. One partial administrative correction procedure would be either to add a certain number to all of A's ratings or to subtract that number from all of B's; another would be to add to A's ratings and subtract from B's. An effective correction procedure can be determined after comparing the ratings given by A and B with the ratings of several other competent instructors. Better still, however, the course director can inform instructors A and B of their error in standards, give them further training, and encourage them to make more consistent yet correct ratings.

Error of Halo

Instructors sometimes allow their rating of performance to be influenced by their general impression of the student. Such an impression is usually formed on the basis of observations or knowledge that have little or nothing to do with the rating. If allowed to influence judgment, this outside influence would result in an upward or downward shift of all ratings. This shift is called an



	1	2	3	4	5	6	7	8	9
INDUSTRY							B,F	A,D,E	C
PROMPTNESS					A,C	D,B,E	F		
EFFICIENCY			A,B,D	C,F				E	
COURTESY		C,D,E	A,B,F						

Figure 23-12. Logical Error Ratings by Six Observers, A Through F

error. There may be many reasons for this error: E may not have had adequate opportunity to observe the performer's efficiency; may have an erroneous conception of efficiency; or may not be able to distinguish between efficiency and industry. In any event, in rating efficiency, E and the other instructors have not rated the same thing. In effect, E rated either efficiency or industry twice.

IMPROVING RATINGS

Ratings can be improved and errors reduced or eliminated by using well-constructed scales, but greater improvement is possible through the training of raters. Satisfactory reliability can be achieved only when an instructor has gained experience in rating and is familiar with all causes of error. Instructors should thoroughly understand the common rating errors, correct rating procedures, and the various rating techniques. The more an instructor knows about causes of unreliability, the easier it is for that instructor to avoid errors.

SUMMARY

Since rating contains, by definition, a subjective element, it is subject to the following types of errors: logical, central tendency, standards, and halo. Despite these possible errors, the rating process may be the most effective method available for the evaluation of a person's overall ability or the quality of performance. Because of common rating errors, differences in ratings may indicate the ability of the instructor to rate rather than the actual difference between the people rated. In view of that possibility, frequent analysis of rating results are necessary. Instructors can further improve ratings through careful consideration of the various steps in the construction of the rating scale and, most important of all, by thorough and continuous training.

For additional examples of rating instruments, see: Chapter 10, Writing and Measuring Affective Objectives; the lessons plans which follow Chapter 17, The Demonstration-Performance Method; and the Appendix to Chapter 26, Using Feedback in the Classroom.

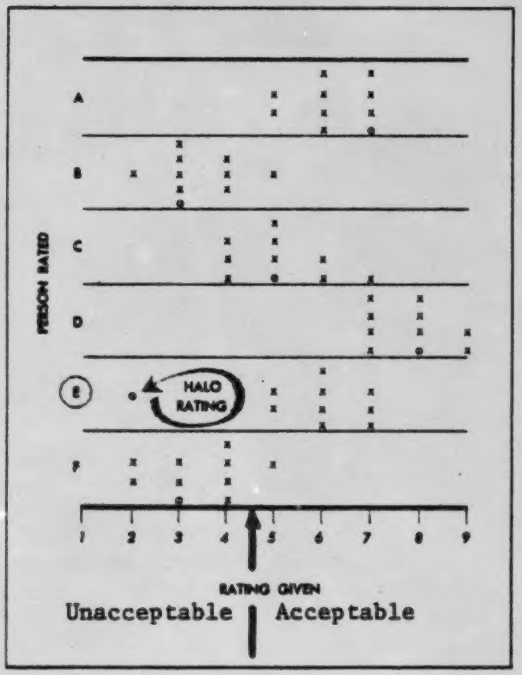


Figure 23-11. Halo Error--Ten Ratings of Six Persons (O Indicates Jones' Ratings; X The Others)

simultaneous use of a large number of instructors is often uneconomical and administratively inadvisable. Even when halo error has been identified, its reappearance cannot usually be predicted. It is the most difficult error to overcome.

Logical Error

A logical error may occur when two or more traits are being rated. It is present if an instructor tends to give similar ratings to traits which do not necessarily go together. For example, some instructors may think that a person who is industrious is also efficient, or that a person who is prompt is also industrious. Industrious persons may often be efficient, but not necessarily so.

The term logical error is used to mean that the traits are related in the mind of the person making the error. The relationship may not appear to be logical to someone else. As a matter of fact, the instructor who exhibits an error of this sort is probably not really aware of it.

Six observers (A, B, C, D, E, and F) rated a certain person on four traits (industry, promptness, efficiency, and courtesy). Their ratings are shown in Figure 23-12. In three of the traits, the six observers agree reasonably well. However, E gave a much higher rating on efficiency than did the other observers. Since E assigned the same rating to both efficiency and industry, it appears that the instructor thinks industry and efficiency are much the same--a logical

Simple Reporting Format for CRT Test Data

	Objective 1	Objective 2	Objective 3	Objective 4
Student A	Yes	Yes	No	
B	Yes	Yes	Yes	No
C	Yes	No		
D	Yes	Yes	Yes	Yes
E	No			

Figure 24-1

Figure 24-1 illustrates a quite simple reporting format for CRT test data. In this example, CRT test results show how each student is progressing in the course based on performance on CRTs. Each CRT gives us pass/fail or go/no go data on each student for each objective. Student A achieved two of the objectives but failed an attempt at passing a CRT on the third objective. Student D attempted and passed a CRT on each of the four objectives. Student E failed the CRT for Objective 1 and has been unable to go on to the other objectives.

We can make many sophisticated variations to this simple grid, but the basic idea remains the same. In order to analyze the effectiveness of our instructional program, we need to test and report CRT data for each student on each objective.

Figure 24-2 is a more sophisticated reporting format but achieves the same basic purposes as Figure 24-1. Actual test scores are reported in Figure 24-2, and the standard for passing is shown. For example, Student D scored only 43 on Objective 1 and failed because a minimum passing score of 85 is required by the instructional objective. This student passed Objective 2 with a score of 13, with 9 listed as the minimum passing score. Student D also scored what appears to be a very fine 98 on Objective 3 but failed that objective because the standard is 100. On the fourth objective, Student D received a passing rating for a task which has no numercial value and which is simply rated "pass" or "fail." Overall, Student D failed, or at least has not yet satisfactorily completed, the course of study. The data on the far right of the grid show that school minimum passing grade is at least three of the four stated objectives. Student D achieved only two objectives--one short of the required minimum. Student D performed well above standard and well above all other students in the group on Objective 2. But since test results on individual objectives are not averaged, outstanding performance on one objective cannot make up for poor performance on others. No averaging, grading on a curve, or use of other leveling devices is another significant difference between CRT analysis and more traditional normative techniques.

An even more detailed display of CRT data is illustrated in Figure 24-3. This figure displays two important additional items of data not found in Figures 24-1 and 24-2:

1. the number of behavioral samples (keyed to the actual number of the test item) used to measure achievement of the objective

2. the level of performance on the test items (mastery level) which is required to show satisfactory achievement of the objective

Chapter 24

CRITERION REFERENCED EVALUATION

Introduction

Tests measure how well students meet our instructional objectives. From true-false tests to simulated war games, we gather measurement data to compare student performance to what we intended to teach. Before we start to teach, tests tell us which students need some or all of what we have to offer. During the course of instruction, tests tell us and our students how they are progressing. At the end of instruction, tests tell us whether individuals have achieved each instructional objective. Whether given before, during, or after instruction, a test which measures carefully written measurable objectives is said to be a criterion-referenced test (CRT).

Some of the special devices we use to report and analyze CRT items are the focus of this chapter. Generally speaking, these devices are different from the ones we have used for many years, or they are old approaches to test analysis with a new point of view brought on by our increasing use of student-centered objectives. For one thing, we are no longer as concerned about using test data to rank order students or to give comparative grades (such as A, B, C). So-called norm-referenced testing (see Chapter 25) is of secondary importance. The primary concern is to measure, report, and analyze student performance as it relates to specific, significant instructional objectives.

The placing of norm-referenced testing and analysis in a secondary role may be the most difficult concept to accept in this manual. See Chapter 25 for a detailed discussion of the use of test data in norm-referenced applications. Most of us have experience with normative testing systems. We have consciously or unconsciously grown to expect tests and test data to be used to rank order or compare students to each other.

We are concerned about how many students passed with a score of 70%, or what percentage of test takers are distinguished graduates. But we often forget the primary purpose of evaluation programs in Air Force schools: to measure student achievement of instructional objectives. No other use of test data should interfere with our need to compare what students can do to what they ought to be able to do, as described by our instructional objectives.

It is important, then, to become familiar with the ways we can obtain, report, and analyze criterion-referenced test (CRT) data. Chapters 3-5 and 20-23 describe in detail the techniques needed to obtain CRT data from well written objectives and tests. In the remainder of this chapter, we will discuss useful ways in which CRT data may be reported and analyzed.

A CRT Reporting Format

We have better ways to report CRT data than percentage test scores or traditional letter grades. Neither of these old standbys tells us what we really need to know. Yes, they do tell us how our students performed relative to others in the class. But the more important question is: Did any or all of the group members reach the course objectives? Relative grading does not report that critical piece of information.

A better way to present CRT data is a simple reporting grid. Already in use in many schools, such a grid lists the objectives to be mastered along one axis and the names of individual students along the other. As each student passes a measure of each objective, an appropriate notation is recorded in the correct square on the grid. If overall class performance on specific objectives is of interest, we can tally individual scores and report the number or percentage of the group who have achieved the objectives.

COMPREHENSIVE SUMMARY OF INDIVIDUAL STUDENT PERFORMANCE

STUDENT RECORD #226638

	OBJECTIVE 1			OBJECTIVE 2			OBJECTIVE 3		
	BEHAVIORAL SAMPLE	TEST ITEM #	PASS/FAIL	BEHAVIORAL SAMPLE	TEST ITEM #	PASS/FAIL	BEHAVIORAL SAMPLE	TEST ITEM #	PASS/FAIL
	1	8	F	2	16	P	1	1	P
	2	9	P	3	22	F	1	2	P
	3	10	F	6	23	P	2	7	F
	4	11	P	7	24	P	2	17	P
	5	12	P	8	30	P			
SUMMARY		5	3		5	4		4	3
MASTERY LEVEL (PASSING)	4 of 5			4 of 5			3 of 4		
MASTERY DECISION (PASS?)	No			Yes			Yes		

Table 24-3. Summary Table of Mastery/Non-Mastery by Curriculum Objectives for a Single Student

Detailed Reporting Format for CRT Test Data

OBJECTIVE

		1			2			3		4			
	RAW SCORE	STD	P/F	RAW SCORE	STD	P/F	RAW SCORE	STD	P/F	P/F	TOTAL OBJ'S PASSED	MINIMUM COURSE STANDARD	COURSE GRADE
Student A	80	85	F	5	9	F	97	100	F	P	1	3 of 4	Fail
Student B	85	85	P	11	9	P	100	100	P	F	3	3 of 4	Pass
Student C	97	85	P	9	9	P	100	100	P	P	4	3 of 4	Pass
Student D	43	85	F	13	9	P	98	100	F	P	2	3 of 4	Fail
TOTALS 4			2 Pass 2 Fail			3 Pass 1 Fail			2 Pass 2 Fail	3 Pass 1 Fail	10 Pass 5 Fail		2 Pass 2 Fail

Figure 24-2

students is to rank them by the number of objectives achieved rather than the average of their test scores or letter grades. Based on CRT data, the ranking for students in Figure 24-2 is (1) Student C, (2) Student B, (3) Student D, and (4) Student A.

The Ideal CRT Pre-test/Post-test Situation

Ideally, none of the students who come to our schools for group instruction should already be masters of our course objectives. If they are able to perform at the level described in our instructional objectives, they don't need the school. By the same token, all students who complete our course should, ideally, have mastered all of the instructional objectives. If the objectives really satisfy Air Force needs and if we really teach and test with a focus on the objectives, we should have all students meet all objectives. This is an ideal we may never achieve, but it is an ideal toward which we work.

If too many students show up in our classrooms already knowing what we intend to teach, we are wasting time and resources by making them take the course. To reduce the number of students who show in a pre-test that they do not need some or all of our school, we can take some of the following actions:

- More carefully describe prerequisites and course objectives to eliminate overlap between courses.

- Design special tracks for individuals through self-paced, individualized instruction rather than lock-step group instruction.

- Provide exemption procedures which allow students to skip some or all of a course while still receiving credit based on a pre-test.

If we must use large group instruction with instruction time as a constant, we may have to settle for less than 100% of the student body achieving all course objectives. We should not take lightly, however, the figure that we do settle for. It may be more reasonable to accept a lesser goal because of scarce resources, limited time, or lack of specific student motivation or aptitude. The effectiveness of group instruction is often judged by arbitrary standards such as 90% of the students will achieve 90% of the objectives (or 80% of the students will achieve 80% of the objectives). These figures may seem far more reasonable than the 100% of the students achieving 100% of the objectives, but we must realize that the 90%/90% standard means that we are satisfied with the course if 81% of the possible objectives are achieved (90% of possible objectives x 90% of the student body to achieve them). In applying the 90%/90% criterion to a course with 20 objectives and 50 students (a possible total of 1,000 objectives to be achieved), we would need to accomplish only 810 objectives overall (18 objectives x 45 students) to consider group instruction to be successful.

There are no statistical techniques to tell us what pre-test and post-test percentages are acceptable. Statistics do not make decisions for us; they simply give us data for decision making. Value judgments are ours to make, and we need to make a value judgment on acceptable pre-test and post-test percentages. We can arrive at these value judgments in many ways, some of which have little or no educational basis. The decisions may be influenced by personnel problems, economic factors, or other considerations.

The Ideal CRT Item Situation

The ideal situation for any individual CRT item is much like that for the overall

In the example in Figure 24-3, Student #226638 has attempted to pass three objectives. The data from this grid reveal that Objective 1 was not passed but Objectives 2 and 3 were (see bottom line of grid, MASTERY DECISION). The data reported for each objective support the pass or fail decision. Five different samples of behavior were tested for Objective 1 (samples 1-5). Each of these samples was tested by a single test item (items 8-12). The pass/fail data for Objective 1 show that this student failed items 8 and 10 but passed items 9, 11 and 12. The mastery level for this objective is set at 4 of 5 items passed. Therefore, the student has failed to achieve Objective 1, and this is so indicated by the word "No" on the bottom indicating the mastery decision.

Data for Objective 2 reveal that this student did pass the objective by answering 4 of 5 test items correctly. As the minimum standard is 4 of 5, a "Yes" is entered on the bottom line indicating the mastery decision.

The student also passed Objective 3, but the data reveal that the test on this objective was put together a little differently and the mastery level has changed. Only two samples are being measured for objective three, although there are four test items. This may be a math objective where more than one problem is typically tested on the same math function. Also note that there are only four test items for this objective instead of five as for Objectives 1 and 2.

We can test any number of behavioral samples with any number of test items we choose. In Objectives 1 and 2, we tested five samples each with one test item for each sample. For Objective 3, we tested only two samples but used two test items for each sample. In each case, the number of samples tested and the number of test items is a value judgment on our part. It is a value judgment in the sense that there may be no precise statistical data or job data which help us make a decision on the number of samples to be tested. We may have to rely heavily on expert opinion to decide what level of performance is acceptable and what level is not.

CRT and Group Performance

Close in importance to the data on individual students is data on the performance of the group. Figure 24-2 gives us totals about the class as a whole so we can evaluate course effectiveness. CRT analysis shows that no objective was mastered by all of the students—an important fact for school managers. Further, students achieved only 10 of 16 objectives (4 students x 4 objectives). These data may raise further questions about the effectiveness of the curriculum or at least about the efficient and effective use of Air Force resources.

Figures 24-1 through 24-3 report individual student achievement of course objectives. We determine how well students have mastered these objectives by tests which measure carefully stated objectives. This display of CRT data for analysis reports the outputs of these courses. We can make the grids more sophisticated, if required, by adding items such as the number of attempts to pass each CRT, the dates of the CRT, and the length of instructional time between CRTs.

Some of the data from these grids could be used to rank order student performance so as to arrive at comparative grades or distinguished graduates. However, these uses of the data should not interfere with the primary purpose of CRT analysis: to account for the performance of each student on each objective. One unique way, then, to use the data from these figures to compare answers in an incoming group might have curriculum implications concerning the need for the course, the level of the curriculum, or the screening of potential students. The small 4% growth figure from pre- to post-test may have more to tell us. It is hard to imagine a case involving an Air Force school where such a growth figure would be acceptable. Whether in relative terms (4% growth on this individual test item) or absolute terms (71% of the ideal of 100%), this post-test statistic tells us something about our curriculum or the delivery of instruction--and it probably isn't something good.

The third test item from Figure 24-4 comes much closer to the pre- and post-test ideal. It appears that the vast majority of our incoming class needs this instruction (100%-12% correct on pre-test = 88% potential growth for class). Of that potential of 88%, we were able to accomplish quite a bit, actually 77% class growth. This is probably good growth and is certainly superior to either of the other sets of test item data.

Setting Practical CRT Item Limits

As a tool for improved test item management, we can set practical limits against which we will measure statistics for group performance on individual test items. No statistical technique will do this for us. The phi coefficient can help us to determine if we are differentiating between masters and non-masters of our course content (see the section on the phi coefficient later in this chapter), but a statistical test probably won't tell us all we need to know to make a decision on practical, acceptable CRT item pre- and post-test limits on test item percentages to better manage our curriculums. In setting these practical limits on individual CRT item pre- and post-test group performance, we will have to consider the

- data from applying the phi coefficient
- quality of the pre-test
- history of pre- and post-test performance of the target student population.
- changing student population characteristics (age, education, experience, rank)
- criticality of the subject matter
- opportunity for self-pacing or tracking
- resources required to raise or lower test scores
- screening or entry requirements
- the opportunity for follow-on training

Group CRT Data as a Management Tool

To the extent that what we want in the way of group performance differs from what we actually get, we have a curriculum problem of some type. We may be able to do a better job managing our curriculum by paying special attention to group or aggregate CRT test item data. In the following hypothetical example of an attempt to improve a curriculum through test item management (Figure 24-5), the variables which may be different in each of our own situations are (1) the acceptable group percentages for pre- and post-test items, (2) the time to respond to curriculum problems revealed by test item analysis, and (3) the individual curriculum responsibilities in cases of unsatisfactory test item data. This example is typical of what can be done to improve the management of curriculums by improving the use of group CRT item data.

test. When any group of students arrives at our school, we should test them to determine their need for our instruction. We may find that they know nothing about one, several, or all of our objectives. The less they know, as shown by the pre-test, the more ideal the situation; the more they need our course. Our selection and screening procedures have worked.

In the previous section on the ideal overall pre- and post-test situation, we discussed objectives as a group and the value judgments involved in setting an overall pre-test or post-test standard. As we look at individual CRT items which measure objectives, however, we need to examine the items one by one. An analysis of group performance on each item in a CRT can be a powerful tool for managing the curriculum. In Figure 24-4 we have data on three test items from a CRT pre- and post-test. In this example, each test item happens to sample a different objective, but the same discussion would apply if all test items measured the same objective.

PERCENT OF CORRECT RESPONSES TO TEST ITEMS

OBJECTIVE 1		OBJECTIVE 2		OBJECTIVE 3	
Test Item #1		Test Item #2		Test Item #3	
Pre	Post	Pre	Post	Pre	Post
20%	56%	67%	71%	12%	89%

Figure 24-4

The data for test item #1 show that just 20% of the students coming in to the course know the material well enough to correctly answer the item. Whether this percentage is too high or too low depends on the value judgments we make. But it is a reference point to which we can make comparisons. An obvious comparison comes about when we see that only 56% of the students correctly answered that same test item on the post-test. Only 36% more of the students were able to pass this CRT item on the post-test than on the pre-test (56% post - 20% pre = 36% growth). This growth does not seem high enough when we compare the 56% post-test percentage with the ideal 100% post-test goal. On the other hand, 56% group performance on the post-test may be acceptable in a short course on a less-than-critical objective. However, thirty-six percent growth is neither bad nor good by itself. Questions need to be asked about the curriculum, the selection procedures, or the evaluation program if only 56% of our students can respond correctly to a post-test item which measures an objective. Is the test item bad, is the objective poorly taught, or is 56% an acceptable post-test achievement percentage considering the possible high level of learning involved? Obviously, the answers to these questions might not be easy.

Data for test item #2 of Figure 24-4 show that a high percentage of the group is already able to pass this test item when they reach our course. The 67% entry figure detracts from the luster of the 71% post-test statistic. These figures may reveal at least two problems. First, a very high entry percentage may raise the question of appropriate content. By itself, the 67% is neither good nor bad, but such a high percentage of correct

b. Improper test item construction

(1) Evaluation will notify the resource person that an item is unacceptable because of poor construction.

(2) The resource person will have ten working days to revise the item.

(3) If the item is acceptable to evaluation, it will be tested for three classes as soon as practical and will again be analyzed for acceptability.

(4) If the item is still unacceptable, it will be treated like items with inappropriate content.

c. Inappropriate content

(1) Evaluation will notify the resource person that an item does not meet the criteria but appears to be valid and written satisfactorily.

(2) The resource person will formulate a plan for improving the content from which the test item was drawn and coordinate it with the branch chief. The plan will be forwarded to the curriculum committee for review and action, if appropriate. The plan may involve changing the level of, redirecting, or otherwise improving the content and resulting test items.

(3) The revision to course content will be implemented as soon as practical, and new or improved test items will then be tested for three classes and again analyzed for acceptability.

4. Remove unacceptable, revised test items/content.

a. Pre-test. The resource person will submit to the curriculum committee a proposal to deal with the content area of the revised test items retaining an $\mathrm{EI} > .49$.

(1) If the revised item maintains an EI of .50 to .75, the proposal should include a plan to develop an alternative method of instruction outside of the core curriculum. The content will remain a part of the school curriculum, however, and the revised test items will continue to be used.

(2) If the revised item maintains an $\mathrm{EI} > .76$, both the test item and the content should be removed from the curriculum through a joint effort of evaluation, the appropriate resource person and branch chief, and the curriculum committee.

b. Post-test. The resource person should eliminate from the curriculum course content evaluated by any revised test items retaining an $\mathrm{EI} < .80$ after revision and try-out. The resource person will submit a proposal for the change through the branch chief to the curriculum committee.

D. Evaluation will monitor the progress of this program to ensure a quality testing program and to provide a significant input into the school curriculum development process. Timely and appropriate in-service training sessions are to be conducted.

Figure 24-5

Characteristics of CRT Evaluation

As we report and analyze CRT data, we assume that we are using good tests and test items to get that data. Good CRT tests and test items must have each of the critical characteristics demanded of all effective evaluation devices (see Chapter 20). CRT items must be reliable, valid, objective, comprehensive, and capable of differentiating. These characteristics are the same as those we have always demanded from Air Force measurement devices, but the characteristics take on a new and unfamiliar look to instructors who have only worked with norm-referenced testing (NRT) (See Chapter 25).

Reliability

A reliable CRT test item or other measure is one that yields consistent results. In other words, will the same person taking the test twice answer the test items much the same way. Reliability is not generally a severe problem with performance rating as long as conditions in the evaluation situation remain constant. Reliability can be a problem in paper and pencil testing, however, because good test item construction is a difficult task.

CRT items with poor reliability are easy to spot if we recognize the symptoms. If students who are about equal in knowledge or ability have scores which vary widely on a criterion-referenced test or test item, we may have an unreliable exam. Likewise, if we test the same student twice on the same CRT test or test item (within a short period of time), and he or she passes once and fails the next time, we may have an unreliable exam. In neither of these cases could we say with certainty that the exam is not reliable, but we should be suspicious. We can use statistics to help us write reliable CRTs. A relatively simple test-retest procedure using the phi coefficient is described later in this chapter.

Validity

For a test to be valid, it must measure exactly what we intended it to measure as defined in our objective. In criterion-referenced testing, there are basically three usable approaches to establishing validity:

- Content validity - Does the CRT measure what the instructional objective specifies?

- Concurrent validity - Does one CRT compare favorably with another, already validated CRT?

- Predictive validity - Can student scores on one CRT be used to predict success on a second CRT?

Content validity. Content validity is probably the easiest and best way to assess whether or not the CRT measures the objective. We can establish content validity by examining the test and comparing the items to carefully written objectives. No statistical test is used to establish content validity. If subject matter experts feel that it measures what the objectives call for, it is valid. If they do not, it is not valid.

This technique for establishing validity is practical and useful for Air Force instruction. A test of content validity is a reputable technique and should be rigorously applied. The usefulness of content validity as a tool in a school will vary with the quality of the objectives. The test may validly measure the objectives, but valid measurement of worthless objectives yields valid but worthless data for the school.

Concurrent validity. If we already have another good CRT measure of what we want to test, we can determine the degree of association between the results of the first CRT and the new one that we want to use. To the extent that they are related, we have established their level of concurrent validity. We may wish to determine a level of concurrent validity between our own exam on management and a nationally recognized exam which has been accepted as valid. We may wish to check the validity of a newly developed multiple-choice management exam against a very time consuming but valid essay exam which is now in use. A statistical test such as the phi coefficient explained later in this chapter is required to establish a level of concurrent validity.

Predictive validity. We can establish predictive validity for our CRT in much the same fashion as we can determine concurrent validity. When we have two CRT measurements of what we believe to be the same skill or knowledge taken at a considerable length of time from each other, we may wish to determine how well the first CRT predicted success on the second CRT. We may wish to see how our school post-test predicts success on the job as measured by supervisor ratings. Or we may wish to determine how well a pencil and paper test can be used to predict future success on a performance exam. In these and similar situations, we can use statistics such as the phi coefficient to establish predictive validity between two CRTs as long as they are both scored on a pass/fail basis and the tests are separated by a substantial period of time. A procedure to establish predictive validity using the phi coefficient is explained later in this chapter.

Objectivity

One of the most obvious benefits of CRT is the positive effect upon objectivity in testing. While it is almost impossible to remove all personal bias from measurement, CRT allows us to come closer to that ideal. We can improve the objectivity of a CRT by insuring that objectives are appropriate and well written. Further, careful attention to content validity greatly improves objectivity. To the extent that any element of the objective is ambiguous, the CRT has the potential to lose its objectivity. Instructor bias may creep into any measurement situation. For help with this problem, refer to Chapters 21, 22, and 23 for assistance.

Comprehensiveness

CRT should be comprehensive by its very definition. Since CRTs measure instructional objectives our tests should be comprehensive by the very act of finding out whether we accomplished what we set out to accomplish. Ideally, we should be 100% comprehensive in our testing programs. Any objective worth stating should be important enough to teach and to measure. There may be some reason to have some objectives which are not measured, but we should be able to justify each case. If our objectives represent our needed and desired learning outcomes and we test them, we have a built-in mechanism to insure comprehensiveness.

The CRT reporting format described earlier in this chapter will help to insure comprehensiveness. When we have to account for individual student achievement on an objective by objective basis, we are guaranteed a comprehensive testing program. Figures 24-1 through 24-3 show ways to account for and report on individual test items and objectives. This practice of displaying CRT data on an item by item or objective by objective basis increases the likelihood of comprehensiveness on samples of behavior as well as instructional objectives.

Differentiation

We can use statistical tests to help us tell whether our test items can tell the difference (differentiate) between persons who have mastered our course and those who have not. Masters of our course include our graduates, those persons exempted from our course because of equivalent training or experience, and those acknowledged experts already working in the field for which we are preparing our students. Non-masters are essentially any group of students or potential students who do not possess or are not supposed to possess the knowledge and skills we teach.

If our test items cannot differentiate those who are graduates of our course from those who are getting ready to take it, we probably have some sort of curriculum problem. The possible problems include poor

- selection of students--too many students coming to our course already possess the skills we intend to teach
- curriculum and instruction--there is little growth on the part of the students during our course
- test items--something in our test items may be causing qualified students to perform poorly while not affecting unqualified persons

Using statistics to differentiate between masters and non-masters is a tough test of our curriculums. A statistical test is a much more rigorous test than the arbitrary limits described earlier in this chapter in the example illustrating the Improved Test Item Management (ITIM) process. Such statistics as the phi (pronounced "fee") coefficient (ϕ) may be helpful in setting the arbitrary limits for ITIM even if the ϕ itself is too rigorous a test for our curriculum. See later in this chapter for a procedure to use the ϕ to test for differentiation between masters and non-masters. We may feel that some arbitrary limits on pre- and post-test item percentages are more practical and realistic than the actual use of ϕ alone. To the extent possible, however, our test items should be able to differentiate between those who are graduates of our courses and those who are not. Statistical tests may help us to make that determination.

This discussion of the use of statistics such as ϕ for CRT test item differentiation is much different than the historical, norm-referenced approach. In norm-referenced test item analysis, we have generally referred to differentiation as the ability of a test item to differentiate between poor overall test performers and high overall test performers. In CRT analysis, our aim is to differentiate between masters and non-masters of our course objectives.

See Chapter 25 for a discussion of differentiation as applied to norm-referenced test item analysis. While there is still value to this norm-referenced practice, we should shift our primary focus for CRT item differentiation to detecting differences between masters and non-masters.

The Phi Coefficient (ϕ)

The phi coefficient is a simple but valuable tool for criterion-referenced test (CRT) analyses. The phi coefficient is a statistic which describes the relationship between two sets of CRT data. This relationship is expressed as a coefficient ranging from -1.00 to +1.00. The closer to +1.00, the closer the two sets of CRT data are positively related. Uses for ϕ described here will include test-retest reliability, concurrent and predictive validity, and differentiation between masters and non-masters. The formula and procedure for the use of ϕ follow:

$$\phi = \frac{AD - BC}{\sqrt{(A+B)\ (C+D)\ (A+C)\ (B+D)}} = \text{(range } -1.00 \text{ to } +1.00\text{)}$$

Sample Matrix

(Pass/Fail Data on CRT #1)

		Fail	Pass	
(Pass/Fail Data on CRT #2)	Pass	B	A	A + B
	Fail	D	C	C + D
		B + D	A + C	

Where: A = the number of students who have passed both CRT #1 and CRT #2

B = the number of students who have failed CRT #1 but have passed CRT #2

C = the number of students who have passed CRT #1 but have failed CRT #2

D = the number of students who have failed both CRT #1 and CRT #2

Figure 24-6

What ϕ Tells Us

The phi coefficient is a value on a scale ranging from -1.00 to +1.00. Very low positive values or negative values are a signal that there is something less than satisfactory with the comparison made in the 2 x 2 grid (see Figure 24-4) used to calculate ϕ. Other statistical techniques can also aid us in CRT analyses, but ϕ is quite simple and versatile. A standard statistics textbook will give further refinements.

Phi does not work well with a student group of fewer than ten and should never be used unless both variables or categories forming the 2 x 2 grid are naturally dichotomous (pass-fail, go-no go, yes-no, acceptable-unacceptable) or are continuous data with artificial cut points to produce pass-fail data. These artificial cut points occur whenever we take a set of scores (1 to 10 or 0% to 100% for example) and draw a passing/failing line at some point. Further examples of this practice include 8 of 10 basketball foul shots, 80% pass/fail score on an exam, or 4 of 5 samples of behavior as evidence of achieving a level of learning objective.

Uses of Phi Coefficient in CRT Analyses

The phi coefficient (ϕ) may be used in many ways to assist us in CRT analyses. Phi will probably handle our basic curriculum needs in establishing CRT test and test item reliability and validity as well as looking at differentiation. For other uses of ϕ or for other statistics needed to aid in your CRT analyses, please refer to the appropriate section of a commercially available text. In addition, we may have to use statistics other than ϕ if we engage in formal research.

Test-Retest Reliability

We can use the phi coefficient (ϕ) if we desire a statistical measure of reliability (consistency) for our CRT items. Figure 24-7 illustrates the use of ϕ to establish the test-retest reliability of a CRT item. We may

---

USE OF PHI COEFFICIENT ϕ FOR TEST-RETEST RELIABILITY

		1st use of item		
		Fail	Pass	
2nd use of item	Pass	B 9	A 34	A + B 43
	Fail	D 4	C 3	C + D 7
		B + D 13	A + C 37	

$$\frac{(34)\ (4) - (9)\ (3)}{\sqrt{(43)\ (7)\ (37)\ (13)}} = \frac{109}{\sqrt{144,781}}$$

$$\frac{109}{380.5} = .29 \text{ (very low reliability)}$$

Figure 24-7

---

determine reliability with other statistics, but ϕ will do the job for many situations. In this example, we are analyzing the test-retest reliability of an examination administered to a group of 50 students in a hypothetical Air Force course. This CRT measures an objective concerned with an understanding of the functions of management. The series of test items which make up this exam may form a separate test, or they may become part of a larger exam which measures several objectives. Within a day or two, the same group of students were again given this exam unannounced.

From the grid, we can see that 34 of the 50 students passed the test both times on this particular instructional objective dealing with management. The grid also reveals that 9 students failed the first test but passed the second; 3 passed the first but failed the second; and 4 failed the test both times.

Using ϕ we can determine that the test-retest reliability of this test exam is .29. This ϕ of .29 tells us at least two things about this test on the functions of management: (1) It is more reliable than another test with a lower ϕ but less reliable than a third test with a greater value ϕ, but (2) it is not a very reliable test based upon the criteria below. We can use these "rules of thumb" when we look at ϕ to determine reliability:

If ϕ is	then reliability is
-1.00 to +.50	very low
+.50 to +.70	good
+.70 to .90	excellent
+.90 to +1.0	so high that ϕ should be checked again for a math error; if no error, reliability is outstanding

If the test from Figure 24-7 were improved to bring the reliability statistics to +.50 or higher, we still might not have a worthwhile test. We may be getting a reliable (consistent) measure, but we may not be measuring what we intended. The test may be more of a measure of some other variable rather than an understanding of the function of management. It may yield consistent results, but it may be measuring the wrong thing.

Concurrent Validity

The ϕ works quite well in establishing the level of concurrent validity between two CRTs. The grid is set up as in Figure 24-8, and the computations are the same as previously explained for use of the ϕ. We can use these "rules of thumb" when we look at ϕ to determine validity:

-1.00 to +.25	very low
+.25 to +.50	good
+.50 to +.70	excellent
+.70 to +1.00	so high that ϕ should be re-examined for a math error; if no error, concurrent validity is outstanding

Predictive Validity

We establish the level of predictive validity between two CRTs in the same fashion as with concurrent validity. With concurrent validity, the two CRT measures are given in a short period of time; the time between CRTs for predictive validity is usually substantial. Figure 24-9 illustrates the way in which the grid is arranged to give the values necessary to compute ϕ for predictive validity. The same rule of thumb given for interpreting ϕ with a test of concurrent validity also applies to a test to predict future performance. When applied to a relatively large sample of students, ϕ is a very useful statistic to establish predictive validity.

USE OF PHI COEFFICIENT TO ESTABLISH CONCURRENT VALIDITY

CRT #1

		Fail	Pass	
CRT #2	Pass	B	A	A + B
	Fail	D	C	C + D
		B + D	A + C	

Figure 24-8

USE OF PHI COEFFICIENT ϕ TO ESTABLISH PREDICTIVE VALIDITY

1st CRT (January)

		Fail	Pass	
2nd CRT (April)	Pass	B	A	A + B
	Fail	D	C	C + D
		B + D	A + C	

Figure 24-9

Differentiation

The most common use of ϕ for differentiation is to determine whether or not our criterion-referenced tests or test items can tell the difference between students as they enter our course and students who successfully complete it. In other words, has our course made a measurable difference. As with the use of ϕ as a tool to determine reliability and validity, we can set up a 2 x 2 grid for our test of differentiation. We have illustrated this use of ϕ in Figure 24-10. This single CRT test item with a ϕ of .60 is doing a good job of differentiating between entering students (pre-test) and graduates (post-test). Students entering the course generally fail the test item; graduates generally pass it. The rule of thumb for interpreting ϕ as a discriminator between masters and non-masters of our courses is:

-1.00 to +.25	very low
+.25 to .50	good
+.50 to +.70	excellent
+.70 to +1.00	so high that it should be re-examined for a math error; if no error, differentiation is outstanding

USE OF PHI COEFFICIENT ϕ TO DIFFERENTIATE BETWEEN MASTERS AND NON-MASTERS

	Fail	Pass	
Graduates (Masters) Post-test	B 5	A 30	A + B 35
Entry-level students (Non-Masters) Pre-test	D 26	C 9	C + D 35
	B + D 31	A + C 39	70

$$\phi = \sqrt{\frac{30 \times 26 - 5 \times 9}{(35)\ (35)\ (39)\ (31)}} = \frac{780-45}{1481025}$$

$$= \sqrt{\frac{735}{1481025}}$$

$$= \frac{735}{1217}$$

$$= .60 \text{ (excellent differentiation)}$$

Figure 24-10

Summary

To report and analyze criterion-referenced test data corectly, we need to use techniques which are different from those we traditionally use. The need to change techniques comes about because CRT is concerned with comparing a student's performance with instructional objectives rather than with the level of performance of other students.

An appropriate display of CRT data will assist us as we analyze the results of our instruction. A reporting format which accounts for individual student achievement for each significant instructional objective is a valuable tool. This reporting format may be as simple as a grid listing each student on one axis and each objective on the other. It may be so complex as to need computer support to keep track of and analyze instructional variables such as learning time and attempts at mastery.

Except for extreme examples, the passing or failing point in a CRT situation is quite subjective. We must often settle for less than perfect performance on our examinations. Time, money, student characteristics, and other variables often affect our standards negatively. Although pre-test scores of 0 and post-test scores of 100% are ideal, we must often accept less than the ideal. The extent to which we exceed the ideal score at entry or fall short of the ideal at exit is a subjective decision. Many complex variables affect that decision.

The phi coefficient (ϕ) is a valuable statistical tool for CRT analysis. It is useful to help establish several of the desired characteristics of evaluation including reliability, validity, and differentiation.

Chapter 25

NORM REFERENCED ANALYSIS

Schools which use evaluation data to compare the performance of one student with the group use some form of norm referenced analysis. Awards to the commandant's trophy winner, the best writer, distinguished graduates, and similar rankings of outstanding groups or individuals are usually the product of norm referenced analysis.

Norm referenced analysis is a classification or label applied to the use of evaluation data for the purpose of comparing students to each other rather than to a specific instructional objective. Many different statistical techniques can be used to evaluate students' scores on written tests and performance rating instruments. In some schools, especially in officer and airmen professional military education programs, there has been a tradition of identifying and rewarding the best performers in each class by comparing students on many different tasks.

Norm referenced analysis is characterized by using data to compare students to the "norm" or average. Any or all of the following items may be used for the purpose of comparing students: written test scores, grades on writing and speaking assignments, grades in drill and ceremonies, grades in physical training, and numerical estimates of various leadership traits.

Let us consider the following hypothetical case to help us distinguish between criterion or objective referenced analysis (see Chapter 24) and norm referenced analysis. Suppose that we will have 50 students in a one-week course. In this course we will use only one evaluation instrument--a final written test of 100 questions. If we set minimum passing at 70% of the objectives being tested and compare students' scores to the 70% standard, then we will be using a form of criterion referenced measurement. If we are more interested in rank ordering our students rather than holding them to a specific cut-off score for passing, this process would be called norm referenced measurement. If we do set a minimum standard for passing *and* if we also desire to rank order students for the purpose of recognizing the students who performed better than others, then we are using both criterion referenced measurement and norm referenced analysis.

This chapter presents several statistical measurements and procedures which are commonly used to compare students with each other. The advent of inexpensive calculators with many functions has decreased the need to be thoroughly familiar with the computations for most statistical measures. However, understanding how to compute various functions helps to reinforce the meaning of statistical concepts.

GRADING METHODS

This section is concerned with several grading methods. The basic data used throughout the examples are the final school grades made by 150 students in a hypothetical Air Force school.

Whatever grading method is used, a frequency distribution of scores should be established first. The scores may be the result of a single administration of the test or they may have been accumulated over a period of time.

Construct the frequency distribution of the scores made by the 150 students (Figure 25-1) as follows:

Step 1. In Column 1, list the scores obtained by the group from the highest to lowest.

Step 2. In Column 2, enter tally marks for each score.

Step 3. In Column 3, record the number of tally marks for each of the scores. Because this column tells how frequently each score occurred, it is known as the "frequency column (f)." The total of this column should be the total number of persons in the group.

This frequency distribution (Columns 1 and 3) is used in computing grades in the remainder of this chapter.

Rank-Order Grades

Rank-order grades are best computed from the basic frequency distribution shown in Figure 25-1. Figure 25-2 shows the rank order which would be assigned to all 150 students. Two tied for the highest rank in the class. If evaluation instruments had the capability of making finer differentiations between the two students, one would have ranked first and the other, second. Since it is not possible to differentiate between them on the basis of information available, they should both receive the same rank-order grade.

In cases of a tie, it is customary to assign all members the median rank of that tying group. The two highest would therefore be assigned the rank-order grade of 1.5/150. Since 7 students tied for the ranks 3 through 9, each would receive the rank-order grade of 6/150.

To find a rank-order grade of tying students, the instructor should follow this procedure: (1) note the lowest and highest ranks of those in the tying group, and (2) average these two ranks.

1	2	3
School score	Tally marks	Number of students (f)
47	||	2
46	𝍸 ||	7
45	𝍸 |||	8
44	𝍸 |||	8
43	𝍸 𝍸 ||	12
42	𝍸 𝍸 |	11
41	𝍸 𝍸 𝍸	15
40	𝍸 𝍸 ||	12
39	𝍸 |||	8
38	𝍸 𝍸 ||	12
37	𝍸 𝍸 ||	12
36	𝍸 𝍸	10
35	𝍸 ||	7
34	|	1
33	𝍸 ||	7
32	𝍸 |	6
31	||||	4
30	||	2
29	||||	4
28	|	1
27	|	1
Sum		150

Figure 25-1. *Tabulation of a Frequency Distribution*

1	2	3
School score	Number of students (f)	Rank-order grade
47	2	1.5/150
46	7	6/150
45	8	13.5/150
44	8	21.5/150
43	12	31.5/150
42	11	43/150
41	15	56/150
40	12	69.5/150
39	8	79.5/150
38	12	89.5/150
37	12	101.5/150
36	10	112.5/150
35	7	121/150
34	1	125/150
33	7	129/150
32	6	135.5/150
31	4	140.5/150
30	2	143.5/150
29	4	146.5/150
28	1	149/150
27	1	150/150

Figure 25-2 *Computation of Rank-Order Grades*

For example, 25 students received scores higher than 43, and 12 students received 43. The highest person in the group receiving 43 would therefore have a rank of 26; the lowest, 37. The rank-order grade for each of these 12 students is computed as follows:

$$\frac{\frac{1}{2}(26 + 37)}{150} = \frac{\frac{1}{2}(63)}{150} \text{ or } \frac{31.5}{150}$$

In computing rank-order grades, the following formula may be used.

$$\text{Rank-order grade} = \frac{\frac{1}{2}(T + B)}{N}$$

Here T is the rank of the student at the top of the tying group; B, the rank of the student at the bottom of the tying group; and N, the total number in the class.

The formula may be used to obtain the rank-order grade for the eight students with the score of 44:

$$\text{Rank-order grade} = \frac{\frac{1}{2}(18 + 25)}{150}$$

$$\frac{\frac{1}{2}(43)}{150} = \frac{21.5}{150}$$

We would say that the rank order of eight students with a score of 44 is 21.5 out of 150 students.

Percentile Rank Grades

The percentile rank for a specific score is defined as the percentage of persons in the reference group who obtained scores equal to or less than the given score. Thus, if a raw score of 50 equals a percentile rank of 87, called the 87th percentile, then 87 percent of the people in the reference group obtained scores equal to or less than 50. A percentile rank of 5 indicates that only 5 percent of the group obtained equal or lower scores. A percentile rank involves percentages of people and indicates a students' relative standing in percentage terms.

Scores on the Airman Classification Test and the Air Force Officer Qualification Test are reported in percentiles. By contrast, percentage scores express performance in terms of percent of content mastered. A percentage score of 85 means that a student answered 85 percent of a test correctly.

Percentile rank grades are computed from a frequency distribution in much the same way as are rank-order grades. The main difference is that percentile-rank grades are computed from the lower end of the scale.

Probably the easiest method of converting a frequency distribution into percentile-rank grades is by the use of the basic distribution of student scores. These steps can be followed:

Step 1. Construct a cumulative frequency column (Column 3 in Figure 25-3) which shows the number of students below the score given. For example, no one scored below 27. Therefore, the entry in Column 3 for 27 is zero. Since one student had a score lower than 28, the entry in Column 3 for 28 is 1. Since two students scored below 29, the entry in Column 3 for 29 is 2. This process is continued to the top score. Obviously, the top entry in Column 3 is 148. The cumulative frequency for the top percentile rank can be checked against the total number in the distribution.

Step 2. Construct a column (Column 4, Figure 25-3) which shows the number of students below a particular score, plus one-half the number of students obtaining that score. Entries for Column 4 may be obtained by adding ½ the number in Column 2 to the entry in Column 3. For example, in Figure 25-3 the entry in Column 4 for the score 36 is 38 because--

½ (10) + 33 = 38.0

For the score 41, the entry is 94.5 because--

½ (15) + 87 = 94.5

Step 3. It is now a simple matter to compute the percent of the total group which lies below the middle of each of the scores. To do this, divide each entry in Column 4 by the total number of students, and then multiply by 100. For example, for a score of 36 the percentile rank would be 25, obtained as follows:

$$\frac{38}{150} \times 100 = 25$$

In other words, the ten students with a score of 36 receive a percentile-rank grade of 25; they are at the 25th percentile. The 15 students who had a

1	2	3	4	5
School score	Number of students (f)	Number of students below each score	Column 3 + half the number at this score	Centile-rank grade
47	2	148	149.0	99
46	7	141	144.5	96
45	8	133	137.0	91
44	8	125	129.0	86
43	12	113	119.0	79
42	11	102	107.5	72
41	15	87	94.5	63
40	12	75	81.0	54
39	8	67	71.0	47
38	12	55	61.0	41
37	12	43	49.0	33
36	10	33	38.0	25
35	7	26	29.5	20
34	1	25	25.5	17
33	7	18	21.5	14
32	6	12	15.0	10
31	4	8	10.0	7
30	2	6	7.0	5
29	4	2	4.0	3
28	1	1	1.5	1
27	1	0	0.5	0

Figure 25-3, Computation of Percentile-Rank Grade score of 41 receive percentile-rank grades of 63 since--

$$\frac{94.5}{150} \times 100 = 63$$

Step 4. These arithmetical procedures can be expressed by the following formula:

$$\text{Percentile Rank} = \frac{Y + f/2}{N} \times 100$$

Here Y is the number of students below a particular score; f, the number of students receiving that same particular score; and N, the total number of students in the class. Usually the decimal portions of percentile-rank grades are not considered important. Consequently, percentile rank is usually reported to the nearest whole percent.

Centile-Group Grades

Many methods of centile-group grading are used, and instructors may invent one to suit their needs. However, all students in a group with identical scores should receive the same grade. Whatever groups are used, some of the dividing lines are almost sure to fall so that they will separate the members of a group who have the same score. In such a situation, it is necessary to decide on which side of the group the line should be placed.

A basic distribution of scores may be grouped in several ways (Figure 25-4). In the first method (A), the class is divided into four groups. The top 20 percent of the class is labeled Superior; the next 30 percent, Above Average; the next 40 percent, Satisfactory; and the bottom 10 percent, Unsatisfactory. Since 20 percent of 150 is 30, a count from the top of the distribution should include 30 students. The 30th student from the top is among the 12 students who received a score of 43. If the dividing line is placed just above this group, only 25 are within the top 20 percent. If the dividing line is placed so as to include the whole group with a score of 43, then 37 students would be within the top 20 percent. Since 25 is closer to 30 than 37 is, the dividing line is placed between the scores 43 and 44. Obviously the position of this dividing line will vary with instructors; and for the individual instructor, it is likely to vary according to mood and general impressions. In Method A, subjectivity is involved even more in identifying the low 10 percent. Since 10 percent of 150 is 15, a count from the bottom of the distribution should include 15 persons. This dividing line falls at the middle of the group which received a score of 32. An arbitrary decision is necessary.

Method B is similar to Method A with these exceptions: five groups are used, the percentages are intended to be symmetrical, and letters instead of adjectives are used to identify the groups. In Method C, the class is divided into ten approximately equal groups. Method D divides the class into quarters.

Arithmetic Mean. The arithmetic mean of a set of scores can be found by totaling them and by dividing the sum by the number of scores. For example, the mean of 103, 101, 98, and 98 is 100.

$$\frac{103 + 101 + 98 + 98}{4} = \frac{400}{4} = 100$$

The method of computing the mean might be further illustrated by considering grades obtained from the class of 150 students (Figure 25-5). The numbers in column f tell how many students obtained each raw score. The mean is computed in the following steps:

School score (raw score)	Number of students (f)	Percentage groupings			
		A 20%, 30%, 40%, and 10%	B 10%, 20%, 40%, 20%, and 10%	C Tenths	D Quarters
47	2	High 20% (Superior)	High 10% (A)	1	1
46	7				
45	8				
44	8		Next 20% (B)	2	
43	12	Next 30% (Above Average)		3	
42	11				2
41	15		Next 40% (C)	4	
40	12			5	
39	8	Next 40% (Satisfactory)		6	3
38	12				
37	12			7	
36	10		Next 20% (D)	8	
35	7			9	4
34	1				
33	7				
32	6			10	
31	4	Low 10% (Unsatisfactory)	Low 10% (F)		
30	2				
29	4				
28	1				
27	1				

Figure 25-4 *Computation of Several Centile-Group Grades With Different Percentage Groupings*

Step 1. Arrange the raw scores of the test in numerical order from highest to lowest without repeating identical scores. (Call this column X.)

Step 2. In a column opposite each score list the number of students who made that score. (Call this the f, or frequency column). Total this column to determine N, the number of students in the class.

Step 3. Multiply each score by the number of students who made that score (fX column). Since the figure shows that two persons obtained a score of 47, this score should appear twice in the list of scores. To save space, 94 (47 multiplied by 2) can be entered in

Test score X	Frequency f	fX	Deviation d	d^2	fd^2	Standard Score $\frac{d}{s}$	T-score
47	2	94	8.1	65.6	131.2	1.76	68
46	7	322	7.1	50.4	352.8	1.54	65
45	8	360	6.1	37.2	297.6	1.32	63
44	8	352	5.1	26.0	208.0	1.10	61
43	12	516	4.1	16.8	201.6	.89	59
42	11	462	3.1	9.6	105.6	.67	57
41	15	615	2.1	4.4	66.0	.45	55
40	12	480	1.1	1.2	14.4	.23	52
39	8	312	.1	.0	.0	.02	50
38	12	456	−.9	.8	9.6	−.19	48
37	12	444	−1.9	3.6	43.2	−.41	46
36	10	360	−2.9	8.4	84.0	−.63	44
35	7	245	−3.9	15.2	106.4	−.85	42
34	1	34	−4.9	24.0	24.0	−1.07	39
33	7	231	−5.9	34.8	243.6	−1.28	37
32	6	192	−6.9	47.6	285.6	−1.50	35
31	4	124	−7.9	62.4	249.6	−1.72	33
30	2	60	−8.9	79.2	158.4	−1.93	31
29	4	116	−9.9	98.0	392.0	−2.15	29
28	1	28	−10.9	118.8	118.8	−2.37	26
27	1	27	−11.9	141.6	141.6	−2.59	24
	150	5,830			3234.0		

$$\text{Mean} = M = \frac{\Sigma fX}{N} = \frac{5,830}{150} = 38.9$$

$$\text{Standard deviation} = s = \sqrt{\frac{\Sigma fd^2}{N}} = \sqrt{\frac{3234.0}{150}}$$

$$= \sqrt{21.6} = 4.6$$

Figure 25-5, *Computation of Mean, Standard Deviation, Standard Scores, and T-Scores*

column fX opposite 47. The next entry is 46 times 7, or 322. The column is completed in this manner.

Step 4. Find the sum of column fX. This is the sum of all 150 scores obtained on the test. In the example, the sum is 5,830.

Step 5. Divide the sum of scores (5,830) by the number of scores (150) to obtain the mean. The result is usually reported to the nearest tenth.

$$\frac{5,830}{150} = 38.867 \text{ or } 38.9$$

The mean can be computed by the following formula:

$$M = \frac{\Sigma fx}{n}$$

Here M is the mean; Σ the Greek letter, sigma, the "summation of"; f, the frequency; X, a test score; and n the number of scores.

Standard Deviation. The same frequency distribution of grades (Figure 24-5) is used here to show how to find the standard deviation of any distribution. The following method is used.

Step 1. Determine how much each test score deviates from the mean. (Call this column d.) This figure can be obtained by subtracting the mean from the test score. For example, 47 - 38.9 = 8.1, the deviation of highest score; and 27 - 38.9 = -11.9, the deviation of lowest score. Note that the deviation of all scores below the mean is negative.

Step 2. Square the deviation. (Call this column d^2.) If 8.1 (the deviation of the test score 47) is multiplied by itself (that is, squared), the product is 65.6. The column is completed in this manner.

Step 3. Multiply the frequency of each score by the deviation squared for that particular score. (Call this column fd^2.) Just as the test score is multiplied by the frequency in finding the mean, the square of the deviation is multiplied by the frequency to find the standard deviation.

Step 4. "Standard deviation" may be defined as the square root of the average of the squares of the deviations from the mean of the distribution. Compute the standard deviation of this distribution by using the following formula:

$$s = \frac{fd^2}{N}$$

Here s is the standard deviation; the "summation of"; f, the frequency; d, the deviation of a score from the mean; and N, the number of scores. The total of column fd^2 is 3,234.0. This total divided by the number of scores in the distribution (150) results in 21.6. The square root of 21.6 is 4.6. Therefore, the standard deviation for this distribution is 4.6. (The standard deviation is usually reported to the nearest tenth.)

Standard Score. Now it is a simple matter to find the standard score corresponding to any given raw test score. Standard scores (SS) are defined as scores expressed in terms of their standard deviation distances from the mean. This definition may be expressed in terms of the following formula:

$$\text{Standard score} = SS - \frac{X - M}{s} \quad \text{or} \quad \frac{d}{s}$$

Here X is the test score, M is the mean, and s is the standard deviation.

The basic formula can be reduced to $\frac{d}{s}$, as d is the amount each raw score deviates from the mean and is the same as X - M.

To calculate the standard score ($\frac{d}{s}$ column), divide the amount each score deviates from the mean (d column) by the standard deviation. For example, the test score 47 expressed as a standard score may be found as follows:

$$SS = \frac{X - M}{s} = \frac{47 - 38.9}{4.6} = \frac{8.1}{4.6} = 1.76$$

T-Scores

Standard scores can be converted to T-scores, which have a mean of 50 and a standard deviation of 10. (Note: T-scores are usually reported to the nearest whole number.) This conversion is expressed in the following formula:

$$\text{T-Score} = 10\left(\frac{d}{s}\right) + 50$$

For example, the test score 47 expressed as a T-score would be found in the following manner--

$$\text{T-score} = 10\left(\frac{d}{s}\right) + 50 = 10 \ \frac{8.1}{4.6} + 50 =$$

$$10(1.76) + 50 = 17.6 + 50 = 68$$

In actual practice, the labor of computing standard deviation and standard and T-scores is reduced considerably by using a slide rule or calculator. Instructors will find many short cuts as they become more familiar with the process.

Grading Methods Compared

To compare grading methods, suppose that two students in a class of 90 received the scores shown in table 25-1 in five subjects. The raw scores tell nothing whatever about the real proficiency of either of these students in the five subjects. It is only possible to draw conclusions about their comparative standings. Inspection reveals that Frank Brown excels John Doe in three of the five subjects, but there is no way of knowing the quality of the difference. If the scores of the two students are averaged, John Doe has the higher average. It might, therefore, be inferred that John Doe is the better student, if the five subjects are equally important.

Table 25-1 Raw Scores Made by Two Students in Five Subjects

Subject	Students	
	Frank Brown	John Doe
A. Practice teaching	156	186
B. Curriculum construction	16	6
C. Special laboratories	30	25
D. Evaluation	11	2
E. Writing	129	130
Average score	68	70

In table 25-2, Brown's and Doe's rank-order grades are shown. These rank-order grades give more information than the raw scores alone. Differences in rank order, however, are not proportional to differences in ability. There is a tendency to infer such a relationship. Furthermore, although Frank Brown ranked above John Doe in writing, such fine discriminations are not warranted near the center of so large a group.

Table 25-2 Rank-Order Scores Made by the Same Two Students in the Five Subjects

Subject	Students	
	Frank Brown	John Doe
A. Practice teaching	45/90	9/90
B. Curriculum construction	11/90	86/90
C. Special laboratories	47/90	79/90
D. Evaluation	16/90	89/90
E. Writing	43/90	42/90
Average Score	32/90	61/90

The scores of Brown and Doe were converted to the centile-rank grades shown in table 25-3. In general, the situation is the same as with the rank-order grades. Again, the apparent difference in abilities of the two students in writing is not genuine.

The mean and standard deviation of the distribution of the 90 scores in each of the five subjects were computed and are recorded in table 25-4. When these values were compared with the

Table 25-3 Centile-Rank Scores Made by the Same Two Students in the Five Subjects

Subject	Students	
	Frank Brown	John Doe
A. Practice teaching	50	90
B. Curriculum construction	88	4
C. Special laboratories	48	12
D. Evaluation	82	1
E. Writing	52	53
Average score	64	32

Table 25–4 T-Score Grades Made by the Same Two Students in the Five Subjects

Subject	Mean score	Standard deviation	T-score	
			Frank Brown	John Doe
A. Practice teaching	156	20	50	65
B. Curriculum construction	12	4	60	35
C. Special laboratories	30	5	50	40
D. Evaluation	8	3	60	30
E. Writing	130	36	50	50
Average score	—	—	54	44

scores of Brown and Doe, their T-score grades for each of the five subjects were obtained. If the normal probability curve and the scales shown in figure 25-6 are kept in mind, a clear picture of the proficiency of each student relative to that of other students is obtained.

Frank Brown is average, or well above average, in all five subjects. John Doe, on the other hand, is above average in only one subject, and clearly below average in three subjects. Furthermore, Brown's mean T-score is well above the average of the total group, whereas Doe's mean T-score is clearly below average.

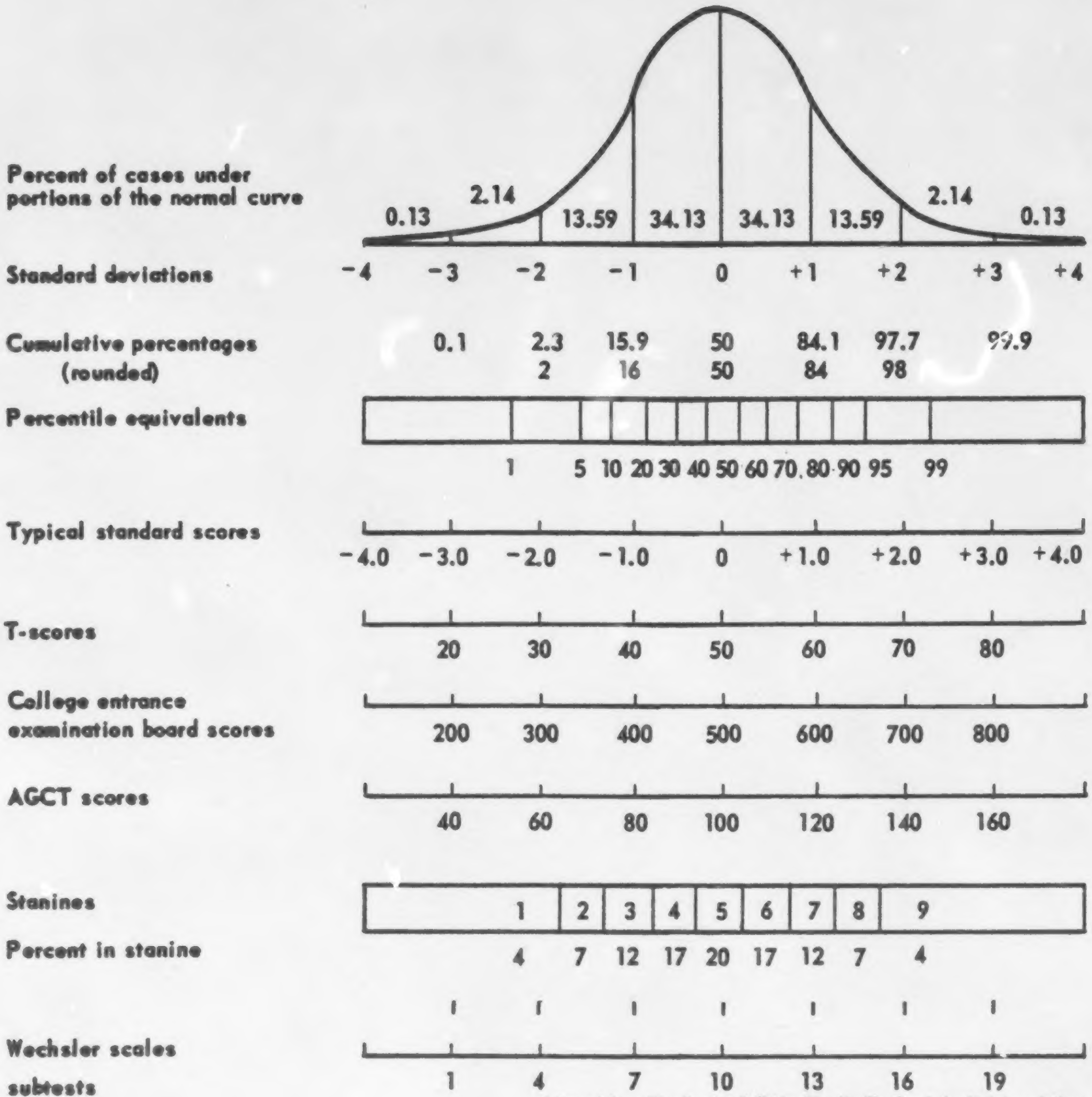
One of the advantages of grades based on standard scores is that they may be averaged fairly. Averages based on other grading methods are open to question. For example, Doe had a higher course average, based on original raw scores, yet he is clearly a poorer student.

When grades in several subjects are to be weighted and then expressed as a single, composite grade, the grades should be based on standard scores. (The instructor can then be sure that each subject has been truly weighted in accordance with the weighting factor.) For example, if scores in each subject are first converted to T-scores, and each set of T-score grades is multiplied by the weighting factor, then each student's sum may be used as a measure of his relative position in the class. This approach to weighting subjects is shown in table 25-5 for Brown and Doe.

T-scores may be weighted, but the original raw scores and accumulated points should not be weighted. Weighting original raw scores may only make weightings less reliable, as in the case of Brown and Doe.

Table 25–5 Weighted Scores Made by the Same Two Students in the Five Subjects

	Weight factor (percent)	Frank Brown		John Doe	
		T-score	Weighted score	T-score	Weighted score
A. Practice teaching	35	50	17.50	65	22.75
B. Curriculum construction	10	60	6.00	35	3.50
C. Special laboratories	10	50	5.00	40	4.00
D. Evaluation	25	60	15.00	30	7.50
E. Writing	20	50	10.00	50	10.00
			53.50		47.75



Adapted from Test Service Bulletin, No. 18, The Psychological Association

Figure 25–6 Comparison of Grading Methods

Most of the grading methods which are used for comparing students with each other are based on the characteristics of the bell shaped normal curve.

Since the properties of the normal curve never vary, it is used widely in normative analysis of testing data. Figure 25-6 shows the normal curve and a comparison of the measurement units which are used with various normative grading methods. You can find an in-depth discussion of the properties and use of the normal curve in any textbook on tests and measurement.

EFFECTIVENESS OF INDIVIDUAL TEST ITEMS

Ease Index of Test Items

The ease index of a test or of a particular test item is a measure of how easy that test or item was for the group taking the test. Since the ease of an item is also a measure of its difficulty, it is sometimes called the difficulty index. The distribution of norm-referenced test scores can be adjusted by changing the ease of items or by eliminating some items and selecting others on the basis of their difficulty. If the difficulty level of items has been adjusted properly, the average score of the group should fall between 50 and 60 percent of the maximum possible score, and scores cover nearly the whole possible range, from the guessing level to almost perfect. This situation is ideal in norm referencing.

Simple Formula for Ease Index

The simplest procedure for determining the ease index of an item is to divide the number of persons who answered the item correctly by the total number of persons who took the test. Multiply this quotient by 100 to convert the result to a percentage figure. The formula for computing the simple ease index (E.I.) of an item is:

$$\text{E.I.} = \frac{R}{N} \times 100$$

Here R is the number responding correctly and N is the number taking the test. If everyone answered the item correctly, the numerator and denominator of the fraction would be the same, and the ease index would be 100 percent. If no one in the group answered the item correctly, the numerator would be 0, and the ease index would also be 0. Consequently, the range of the ease index is from 1 to 100 percent. The higher the percentage, the easier the item; that is, an item with an ease index of 80 percent is easier than an item with an ease index of 35 percent.

The responses of 150 airmen to a question on a management test are shown in table 25-6. On the basis of 47 correct

Table 25-6 Distribution of Correct and Incorrect Responses Made by 150 Airmen on a Multiple-Choice Item on a Management Test

Groups according to total test score	*Number of responses*		*Total number of students*
	Incorrect or omitted	*Correct*	
High third (above 65)	22	28	50
Mid-third (61-65)	38	12	50
Low third (36-60)	43	7	50
Total	103	47	150

answers, the ease index (E.I.) of this item would be computed as follows:

$$\text{E.I.} = \frac{47}{150} \times 100 = 0.31 \times 100 = 31\%$$

Interpreting the Ease Index

The ease index is only a statistical indicator. It should not be used by itself to judge the worth of an item. Rather it should be used in conjunction with other data. All statistical data (including the ease index) used in comparisons must be based on equivalent groups. For example, an item having an ease index of 85 percent with an advanced group of students might well have an ease index of 45 to 60 percent with a group of basic students.

An effective norm-referenced test should include items representing a considerable range of difficulty, but most of the items should be of about average difficulty (ease index of 50 to 60 percent). If instructors have a pool of test items, they can select items from it to cover the range of abilities in the class in such a way that the distribution of test scores fills the scale and approximates a normal curve.

Differentiation Index of Test Items

Whenever an item is answered correctly by some students and not by others, it divides the class into two groups. This question arises: In what other way are the two groups different? The really effective instructor wants to know not only those students who answer an item correctly, but also the kind of student who has the ability to answer it correctly.

One means of analyzing an item is to determine the total test standing of the students who answer the item correctly. If the students who answer the item correctly are predominantly those with high total test scores, the item is adding to the effectiveness of the test as a whole. It is contributing positively toward the differentiating ability of the test.

If students who answer the item correctly are about equally divided between those with high total test scores and those with low scores, the item contributes little or nothing to the differentiation of the test as a whole. In fact, it may detract from the efficiency of the test by unfairly adding to the scores of some students and subtracting from others. The possibility should not be overlooked that the quality of instruction rather than a poor test item could be the reason for little differentiation.

In general, the group that responds correctly to any item should be composed principally of students who have high total test scores. This incidence of scores is particularly necessary if the test is designed to cover material which is closely related. In this situation the test should have high consistency within itself. An item which can be used to separate students who achieve high total test scores from those who do not is said to have differentiation ability. For purposes of analysis and comparison, this ability can be represented by an index number.

Computing Differentiation Index

The differentiation index measures the ability of an item to differentiate between students with high scores on the total test and those with low scores.

There are a number of formulas for computing the differentiation index. The formula selected must be the one that best fits the needs of the user. (Some testing authorities use the term discrimination index or validity index when discussing this type of test analysis.)

One method of computing the differentiation index is to divide the test papers into groups based upon the over-all test scores. If three groups are used to compute the differentiation index of 150 students, for example, the best 50 test papers are placed in the high group, the next 50 papers in the middle group and the last 50 papers in the low group. The number of students in each group who responded correctly to the item are then counted. For the management test, 50 airmen were in each third of the class. In the high third, 28 airmen answered the item correctly; in the middle third, 12; in the bottom third, only 7 (table 25-7).

The number of persons in the low third who answered the item correctly is subtracted from the number of persons in the high third who also answered it correctly. This difference is then divided by one-third the total number of students in the group. (This represents the total number of students divided by the number of groups used. In this case, three groups were used /of course, the groups may vary from 1, 2, 3, 4, 5, and so on/, therefore N is divided by 3.) The formula for computing the differentiation index (D.I.), when three groups are used is:

$$\text{D.I.} = \frac{H - L}{N/3}$$

Here H is the number of students in the high third who answered the item correctly. L is the number of students in the low third who also answered the item correctly, N is the number of students who took the test, and 3 is the number of groups. The differentiation index for the example given would be:

$$\text{D.I.} = \frac{H - L}{N/3} = \frac{28 - 7}{150 \div 3} = \frac{21}{50} = 0.42$$

The index of 0.42 indicates the degree to which the item differentiates between those students who obtained high total test scores and those who obtained low total test scores.

Note that the symbols in the formula for the differentiation index duplicate those of the formula for the validity index discussed earlier in this chapter. However, the indexes represent different things. The difference lies in the criteria used to obtain either index.

Interpreting Differentiation Index

The theoretical range of the differentiation index is from -1 to +1. If all students in the high group answered the item correctly and no one in the low group got the item correct, a +1 differentiation index would result. If all students in the low group got the item correct, when none in the high group did so, a -1 would result. If the same number of students in both the high and low groups responded correctly, the differentiation index would be 0. As can be seen, when the test scores indicate that more students in the upper third of a class answer an item correctly as opposed to those in the lower third, the item is said to have a positive (or plus) differentiation. On the other hand, if more students in the lower third get the item correct, it is said to have negative differentiation. Any item may be neutral or have zero differentiation because of an equal distribution of scores. If this occurs with very easy or very difficult items, it may be acceptable. However, items with very low positive differentiation, zero differentiation, or negative differentiation should be qualitatively examined for validity. If neutral or negative differentiation occurs with items of medium difficulty, the reason should be determined and corrected before the item is reused.

ANALYSIS OF ALL RESPONSES TO A TEST ITEM

In addition to the information available from the ease index and differentiation index calculations, another useful source for test item analysis is found in looking at all the responses to a test item.

This can be accomplished by portraying response information in the same general format as is done for the differentiation index. In this case, however, attention is directed to all responses, not just those made to the correct answer. Quite often the ways students respond incorrectly can provide valuable information on the effectiveness of a test item.

Table 25-7 which lists the responses to a four alternative multiple-choice item will be used to illustrate this type of analysis. This method, however, can be adapted to other types of test items.

When the distribution of the 150 responses to this question are analyzed, the following aspects are worth noting:

- The item has a substantial differentiation index (0.42), as has been shown. The distribution shows a definite relationship between the total test score and correct responses (Alternative "c"). Nearly two-thirds of the airmen who selected the correct responses were from the high third of the class in terms of total score. More than half of the airmen in the high third of the group selected the correct response.

- No one in the group chose Alternative "a." Since the item has essentially three alternatives, Alternative a should be reworded, removed, or replaced. This alternative should be constructed to appeal to some of the 90 airmen who either answered the item incorrectly or deliberately omitted it.

- Half of the airmen who selected Alternative "b" came from the high third of the group. This fact indicates that these airmen may have been given some misinformation or that they have been misled by the wording of the alternative. Only the correct response should be positively related to the total test score. This alternative should be rewritten.

Table 25-7 Number of Times Each Alternative was Chosen as the Correct Response and the Number of Omissions for a Multiple-Choice Item on a Management Test

Groups according to total test score		*Alternatives*				*Omissions*		*Total number of students*
		a	*b*	*c**	*d*	*Item reached*	*Item not reached*	
High third	95 65	0	16	28	6	0	0	50
Mid-third	64 61	0	10	12	10	10	8	50
Low third	60 36	0	9	7	12	17	5	50
Total		0	35	47	28	27	13	150

* Alternative *c* is the correct response.

- Alternative "d" has been selected most often by airmen in the low third. It is differentiating in terms of the total test and is, therefore, a good distractor.

Data furnished by a tabulation, such as that given in table 25-7 are useful to the test constructor and interpreter. If the item is valid, the data may be interpreted as follows:

- Students who selected the correct response to the item can be assumed to have achieved that objective of the instruction.

- Students who selected incorrect alternatives or who omitted the item can be assumed not to have achieved that objective of the instruction.

- Alternative "a" is ineffective and must be replaced; further investigation is required regarding Alternative "b"; Alternative "c" is apparently good as it is.

- Students who reached an item, but omitted it, did so by choice.

- Subsequent items were omitted because the students failed to reach them.

SUMMARY

Instructors should use norm referenced analysis when there is a need to compare students with each other. We may want to provide recognition and awards to students who perform very well. Also by using norm referenced analysis of evaluation data, we can identify those students who are not doing well in our classes when their performance is compared with the performance of other students.

Statistical measures used in norm referenced analysis include rank ordering, percentile ranking, percentile grouping, standard scores and T-scores. Also, the mean and standard deviation are used to calculate many statistical concepts.

Several important phases are considered in evaluating the worth of a norm-referenced test. When a test is working effectively the scores resemble a normal curve of distribution, having a wide range with the majority of the scores grouped near the center of the distribution. It is useful to analyze individual test items in terms of difficulty level and ability to differentiate. Through proper interpretation and use of this information from each item, the instructor can analyze each test to see if each test item is achieving its purpose as planned.

Chapter 26

USING FEEDBACK IN THE CLASSROOM

We all are familiar with courses which consist of readings, lectures, an assigned paper or project, and tests. In traditional courses like these, individualized comments from instructors to students are limited to grades on papers, quizzes, exams, and the final grade. But comments of this sort come well after students have been evaluated on their course work. If there is any impact on learning, it will come during the next phase or in another course or in some follow-on activity on the job.

Such after-the-fact comments--called summative evaluation--often contribute little to student learning because they come too late for the student to take corrective action. On the other hand, the most important job of an instructor may be to provide information which students can use to improve themselves during the course. Such information--called formative evaluation--guides students while they can still take corrective action and also gives instructors clues to the need for a change in teaching approach.

DEFINITION AND THEORY

In order to differentiate between end-of-course grading and information an instructor may provide during a course, many educators use the word feedback. In general, feedback is any information about the results of a process. When we use a computer, for instance, we feed in information and get back feedback. In the social sciences, feedback is the information which returns to the source of a process (or to a preceding stage) so as to reinforce or modify it. If the coach finds that the football team is weak in defensive tactics, for instance, players are scheduled for more blocking practice. In psychological jargon, feedback is called knowledge of results.

In the classroom, then, feedback can be defined as information students receive from their instructor about their performance which will cause them to take self corrective action and guide them in attaining the goals of the course more effectively.

This notion of feedback or knowledge of results is actually quite complex. Textbooks use such terms as primary versus secondary feedback, extrinsic versus intrinsic, augmented versus summary, and specific versus general. Students receive feedback from at least five sources: the self, the learning task, fellow students, the instructor, and from the school. We do not understand completely how the process works in each instance, but the broad outline is clear.

Feedback generally serves one or two purposes: informational and motivational. The first is generally responsible for correcting errors the student commits. The second motivates the student to try harder. Informational feedback should be always motivating, but motivational feedback does not necessarily provide information. A pat on the back or a word of encouragement may motivate a student, but will not necessarily point out errors in that student's performance.

Feedback seems most effective when narrative comments are accompanied by numerical scores or ratings, especially when students clearly understand the scales or numbers used. Narrative summaries have a higher chance of being biased than scores or ratings, and if the narrative is too specific or if it goes too far, the feedback may actually be counterproductive.

It is important to realize that feedback need not always be negative or destructive. In fact, positive feedback is almost always seen as warmer and more sincere than negative feedback given in identical ways. This perception of warmth is significantly related to expanded effort, acceptance of feedback, satisfaction with feedback, satisfaction with student goals, satisfaction with student performance, and satisfaction with the instructor. Students appear to have a tolerance level for criticism, but some perceive an instructor's attempt to point out weak areas as threatening. This perceived threat often causes defensive behavior on the part of the student which may result in lack of improvement.

It might appear that the best advice is "to accentuate the positive," or to discuss positive feedback and ignore the negative. This technique, however, is not the answer. Students reinforced only for success tend to lower their goals in order to ensure success. Criticism may hurt, but praise may not always help.

We cannot reconcile these conflicting statements about feedback more than to say that positive information is more readily received than negative. Negative information generally tends to arouse defensive behavior on the part of the student. Yet teachers must stress positive aspects of student performance at the same time that they adequately communicate weaknesses and needed improvement. An emphasis on the positive should enhance student receptivity or acceptance, and, it is hoped, foster some attempts to apply the feedback in the future.

GIVING FEEDBACK TO STUDENTS

The purpose of feedback is to improve student performance. In its most effective form, it provides constructive advice, direction, and guidance to students in their efforts to raise their performance levels. It is a communication medium in the sense that the instructor can review course standards with the students and provide feedback on their performance in relation to these standards. Students must understand the purpose and role of feedback in the learning process. Otherwise, as we have seen, they may reject the feedback and make little or no effort to improve.

Feedback can also be used as a device to reinforce learning. Although all feedback cannot be used in this manner, the instructor should take every opportunity to use feedback as a means of clarifying, emphasizing, or reinforcing instruction in certain areas. For example, if several students falter when they reach the same step in a weapon assembly, student feedback may indicate a need for the instructor to repeat an explanation or a demonstration or to give special emphasis to the step in subsequent critiques.

CHARACTERISTICS OF EFFECTIVE FEEDBACK

Objectivity

Effective feedback focuses on the student and student performance; it should not reflect the instructor's personal opinions, likes, dislikes, and biases. For example, if a student demonstrates a complicated wiring sequence, it would be unfair to give feedback on personality traits unless they interfere with performance. If a student makes a speech and expresses views that conflict with the instructor's beliefs, the instructor should give feedback on the merits of the speech, not on the basis of agreement or disagreement with the student's views.

The "error of halo" is a pitfall in giving feedback much the same as it is a pitfall in summative evaluation. Instructors sometimes permit favorable or unfavorable impressions of students to influence their judgment. Sympathy or over-identification with a student can be a barrier to objectivity. A conflict of personalities can unwittingly color a judgment. To be objective, feedback must be honest; it must be based on actual performance--not performance as it could have been or as the instructor and the student wish that it had been.

Acceptability

Students must first accept the instructor before they can willingly accept feedback. They must develop confidence in the instructor's qualifications, teaching ability, sincerity, competence, and authority. Usually, the instructor has the opportunity to establish rapport and mutual respect with students before the need for giving feedback arises. If there is no such opportunity, however, the instructor's manner, attitude, and knowledge of the subject must serve instead. Students usually accept feedback when instructors give it and present it with conviction and sincerity. The competent instructor does not rely on rank or position on the faculty as a basis for feedback. Although these are important elements of an instructor's authority, student acceptance depends on more active and demonstrable qualities.

Constructiveness

Feedback is pointless unless a student profits from it. Praise just for the sake of praise has no value, unless the only goal is to motivate or improve self-concept. The instructor should identify a fault or a weakness and also provide positive guidance for the student to improve. Negative criticism that does not point toward improvement or a higher level of performance should be omitted from feedback.

Effective feedback reflects the instructor's consideration of the student's need for self-esteem, recognition, confidence, and the approval of others. Ridicule, anger, or fun at the expense of the student have no place in constructive feedback. Occasionally, the instructor should offer comments to the student in private. In some cases, discretion may rule out any feedback at all. For example, feedback may not help a student impaired by a physical defect where the student is unable to change. Although instructors need to be straightforward and honest, they must also respect the student's personal feelings.

Flexibility

As effective instructors, we should remain flexible in giving feedback. We should avoid mechanical, predetermined techniques and preconceived opinions regarding content, subject matter, and student capability. We should consider the actual content of a student effort or what actually happens during a student activity. We then give feedback on those observed factors that affected performance. Sometimes a good student will do poorly, and a poor student will do well. A friendly student may suddenly become hostile, or a hostile student may suddenly become friendly and cooperative. We should be honest enough to evaluate each effort on its own terms.

Instructors should also be sensitive to student reaction to their feedback. If a student does not respond to a given comment, we should not dwell at length on that area because our criticism will likely fall on deaf ears. On the other hand, if the student shows a keen interest or appears motivated in a given area, we should offer a more detailed analysis of the area and other suggestions for improvement.

Instructors should vary their organization and methods of giving feedback. We may choose to begin with our own comments, continue with a group critique, if appropriate, and finally request individuals to give feedback on their own performances. Additional ideas on organizing and conducting a feedback session are included later in this chapter.

Instructors should also vary their approaches to cope with different situations and adapt the tone, technique, method, organization, and content of the feedback to the occasion and to the student. We frequently confront the problem of selectivity--what to say, what to omit, what to stress, and what to minimize. In determining our approach, we must consider the class situation, student ability, subject matter, the time allotted for the feedback, and other factors. Feedback should never be so rigidly designed or executed that the instructor cannot allow for variables.

Organization

Unless feedback follows some pattern of organization, a series of otherwise valid comments may lose their impact. Almost any pattern is acceptable if it is logical and understandable to the student and to the instructor. Therefore, the instructor should inform the student what the pattern is going to be, thus improving the student's comprehension of the feedback. For example, an effective organizational pattern might be the sequence of the student activity itself. In certain instances, feedback can begin at the point of failure and work backward through the steps that led to the failure. A successful performance can be analyzed in similar fashion.

Sometimes a defect is so glaring or a strength so obvious that it overshadows the remainder of the student activity and can serve as the focal point of feedback. Breaking the whole into parts or building the parts into a whole has strong possibilities. Whatever the organization of the feedback, the instructor should be willing to change if the student cannot understand it.

Comprehensiveness

Comprehensive feedback need not be extremely long nor must it treat every detail of a student's performance. As instructors, we must decide whether we can achieve the best results by discussing a few major points or a number of minor points. We should base our feedback either on what areas need improvement or on what areas we can reasonably expect a student to improve.

Effective feedback includes both strengths and weaknesses. Only the instructor can determine a proper balance between the two. It is a disservice to students to dwell on the excellence of their performances and neglect areas that need improving.

As instructors, we should be specific with our comments and recommendations. Such a statement as, "Your second phase wasn't as good as the third phase," has little value to the student until the student learns exactly why the second phase was not as good as the third phase. If we have clear, supportable ideas in mind, then we should express them firmly and authoritatively in terms that can be easily understood. Specific examples followed by practical suggestions are more meaningful than generalities. Students cannot act upon recommendations unless they understand what the recommendations are. At the conclusion of a feedback session, students should have no doubts concerning what they did well, what they did poorly, and, most importantly, how they can improve.

METHODS OF GIVING FEEDBACK

The critique of a student's performance is always the instructor's responsibility, and we can never delegate it in its entirety. However, we can add interest and variety to our feedback if we exercise our imagination and draw on the talents, ideas, and opinions of others. The following methods for giving feedback may be used individually or in combination.

Instructor Feedback

Most critiquing results from the direct leadership and guidance of the instructor. We conduct workshop sessions to refine skills; we hold individual conferences or critique in front of a group; we examine outlines and drafts; we coach and conduct practice sessions.

Group Critiques. Sometimes we give feedback in a one to one, student/teacher setting, but a more efficient way is often within a general class session. Students may make identical mistakes as they perform an exercise or explore new experiences. Giving feedback to a group of students means that more aspects of the subject can be covered.

Written Feedback. When we write down feedback we can devote more time and more thought to preparing it than we can when giving immediate oral feedback in the classroom. What we lose in spontaneity we often make up for in more complete, carefully considered comments. Written feedback also gives students a permanent record they can refer to as necessary. Rating scales, a form of written feedback, often provide for a standardization among instructors that students appreciate.

Because so many academic instructors evaluate writing and speaking, an appendix to this chapter includes graphic rating scales and brief but specific guidance for giving feedback in these two subjects.

Student Feedback

Other methods of feedback focus on student leadership under the supervision of the instructor. We often involve students in the feedback session because they learn as they help teach others. Many civilian schools use a system of teacher's aids or graduate assistants to help with the feedback because direct involvement with students can be extremely valuable. The more experienced the students, the more effective student-centered feedback can be.

Self-evaluation. One goal of education is to give students enough confidence to be self-critical. Allowing them to evaluate their own performances can help with this process. Beginning writing students, for instance, can often spot elementary errors in their own work if they participate in a supervised proofreading exercise. When television facilities are available, an effective way to critique public speaking is for students to see themselves on TV. Giving students a checklist or a scale of some sort often aids them in self-evaluation. When students evaluate their own work, the instructor usually needs to follow up and make sure the feedback is complete and accurate.

Student-led Evaluation. Students can give feedback in a variety of different ways, but they must never be put in a position of substituting fully for the instructor. Sometimes a student can lead the discussion in a group feedback session, but the instructor will usually set the ground rules. The efficiency of this type of feedback may be limited by inexperienced participants, but it may also generate a high level of student interest, participation, and learning. In student-led evaluation, the instructor invites members of the class to comment on student activitiy or singles out one student to present all the feedback. Still another technique is to divide the class into small groups and assign each group a specific area to comment on. Using basic criteria and guidelines furnished by the instructor, these groups then present their findings to the class. Their combined reports provide comprehensive feedback of individual and class performance.

Whatever the method, the instructor must remain responsible for the overall quality and completeness of the feedback. If the students participate in the feedback, the instructor must make allowances for their relative inexperience. Normally we should reserve time for ourselves at the end of sessions which contain student feedback to cover those areas that may have been omitted to those areas not given sufficient emphasis.

SUMMARY

Since, by the nature of their job, instructors are evaluators, they should have the ability to give feedback in the classroom. Feedback is not part of the grading process but a step in the learning process. The purpose of feedback is to improve future performance of the student and, when possible, to reinforce learning. Effective feedback stresses both student strengths as well as suggestions for improvement. Feedback should be acceptable, constructive, flexible, organized, and comprehensive. Classroom feedback may be varied for interest, and it may be both written and oral. Student participation in feedback should be carefully supervised and instructors should reserve time for themselves to ensure adequate coverage.

GROUND RULES FOR GIVING FEEDBACK

The following ground rules aid the instructor when providing feedback.

- Establish and maintain rapport with the students.

- Tell the students the organizational pattern to be used in the feedback.

- Cover the major strengths and weaknesses. Try to be specific and give examples if possible.

- Avoid trying to cover everything. A few well made points may be more beneficial than numerous but inadequately developed points.

- Do not extend feedback beyond its scheduled time. A point of diminishing returns can be reached quickly.

- Allow time for a summary of the feedback to reemphasize the most important things that a student should remember.

- Try to avoid comments with "never" or "always"; most rules have exceptions. Your feedback may be wrong.

- Do not criticize something that cannot be corrected.

- Do not criticize when you cannot suggest an improvement.

- Avoid controversies with the class, and try not to take sides with group factions. Stop the discussion before arguments get started.

- Avoid being maneuvered into the unpleasant position of defending feedback. If the feedback is honest, objective, constructive, and supported, no defense should be necessary.

- If part of the feedback is written, it should be consistent with the oral feedback.

CRITIQUE SHEET FOR SPEAKING SKILLS EXERCISE

INTRODUCTION					
ATTENTION:	○ Omitted; unrelated to subject; offensive or vulgar.	○	○ Appropriate; focused on subject.	○	○ Stimulating; original; context clear.
MOTIVATION:	○ Omitted; importance of subject not evident.	○	○ Related to most listeners; established importance of subject (and expertise of speaker, if appropriate).	○	○ Compelling; appealed to needs of all.
OVERVIEW: Not used. ○	○ Confused, vague, or misleading; needed but not used.	○	○ Described organizational pattern and listeners' roles; listed main points.	○	○ Clear; prepared listeners fully.
DEVELOPMENT					
ORGANIZATION:	○ Vague; hard to follow main ideas.	○	○ Main ideas related.	○	○ Enhanced meaning; logical progression.
SUPPORT:	○ Inadequate, insufficient, or extraneous; used out of context; source omitted or lacked credibility.	○	○ Credible facts and opinions.	○	○ Accurate, full exposition of ideas
TRANSITIONS:	○ Omitted, vague, abrupt; overuse of "okay" or other stock expressions.	○	○ Established continuity.	○	○ Easy, smooth, varied; related previous points to new points.
VISUAL AIDS: Not used. ○	○ Sloppy, unsupportive, busy; awkwardly used; misspelled words; needed but not used.	○	○ Supported or illustrated ideas.	○	○ Stimulating; well-timed; effectively translated verbal material into visual terms.
ACHIEVEMENT OF OBJECTIVE:	○ Not met.	○	○ Partially met.	○	○ Fully met.
CONCLUSION					
SUMMARY:	○ Omitted; incomplete; mechanical.	○	○ Reviewed essential ideas and relationships.	○	○ A synthesis; fostered retention of ideas and relationships.
REMOTIVATION:	○ Omitted; ineffective.	○	○ Reemphasized importance of subject to most listeners.	○	○ Challenging; capitalized on potential use of information for all.
CLOSURE:	○ Omitted; inadequate; indefinite; abrupt.	○	○ Definite; appropriately tied to subject.	○	○ Positive impact; satisfying sense of completion.

COMMENTS:

FEEDBACK FOR STUDENT SPEAKING

1. Make the speech feedback session as effective as possible by adjusting to the communication transaction. For example, when giving a student feedback, consider as wide a range of variables as possible--the type of speech, the maturity of the student, the setting for the session. What works in one situation may not work in another. Taking a transactional approach shows that you recognize the complexity of the feedback process. Specifically:

a. Adapt feedback to the student. Human beings are sensitive to comments made about them, and the person is always more important than the performance. A word of praise or a word of disapproval will stay with the student for a long time. When reviewing a speech, try to separate the performance from the individual. Instead of "what you did wrong," say "what you might have done to make the speech better." Instead of "what you should have done," say "next time you speak you might...."

b. Comment on both content and delivery. Often an instructor directs attention almost exclusively to delivery (focusing on such things as eye contact, movement, gestures, or voice) or on content alone (focusing on such things as subject, main points, or supporting material). To help the student develop totally as a speaker, be sure to consider both these aspects.

c. Encourage self-evaluation. Evaluating is often thought of as one-way communication where the instructor furnishes all of the ideas--a kind of self-action. The best feedback is more of an interaction or a transaction. Instead of saying to a student, "you did this" or "you didn't seem to pay any attention to that," a better approach might be to ask, "What do you think of your performance?" or "What could you do to improve?" In this way the student becomes involved with the instructor. If the student does not respond, the instructor might ask if there is any particular problem the student wants comment about. Remember the first goal is to help the student, not merely to give advice.

d. Follow criticism with suggestions for improvement. It doesn't help students to tell them their attention steps were ineffective or their organizations difficult to follow if a better way is not suggested. Constructive feedback implies building not tearing down.

e. Mention as many favorable factors as you honestly can. Candid approval opens the recipient's mind. Speaking is a terrifying experience for many people. Most speakers need affirmation for things they did well. If many negative factors and few positive ones are mentioned, the challenge to improve seems overwhelming.

f. End comments on a note of praise. Repeat again any outstandingly good item in the performance. If it is difficult to find items to praise, describe the progress the student is making. The giving of undeserved praise makes the instructor less credible with the class and with the student being reviewed.

2. Make the speech feedback as effective as possible by avoiding these common traps:

a. Avoid abstract general approval (or disapproval). Instructors who say only "That was a good speech" are not doing their job. Adjectives such as "wonderful" or "interesting" may make the student feel good for the moment, but they provide no motivation for growth or improvement. By the same reasoning, abstract expressions of disapproval such as "terrible" or "bad" also fall short of the objective of useful feedback.

b. Avoid summarizing the speech. After a well-organized student has finished, the instructor may be tempted to enumerate the main points and summarize the support. While such comments may be interesting and show that the instructor was listening, the result is simply a short speech about a longer one. Summary is not feedback.

c. Resist the impulse to extend the speaker's subject. A student's topic may be so arresting or controversial that you may want to take the floor yourself and present additional ideas. The student's train of thought may legitimately stir up associated ideas, but free association is not feedback.

d. Avoid calling attention to minor faults which will correct themselves automatically. Suggestions to the student for improvement should genuinely make the speech better. Telling the student to speed up, move around more, quit playing with a paper clip, or stop being so nervous have limited usefulness. Keep trivialities in proportion.

e. Don't criticize something that can't be corrected. It does little good to criticize eye contact of a student who has crossed eyes or the accent of a person from another part of the country. If the problem is not correctable or the correction is not worth the effort and expense required, then don't mention it.

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WRITING CRITIQUE SHEET

CONTENT (What was Written)

STUDENT NAME ______________________ CLASS ______________________

ASSIGNMENT ____________ GRADER ______________________ PASS ______ FAIL ______

INTRODUCTION (Preparing the Reader)					
TITLE:	○ Not descriptive. Too broad; not limited. Subtitle needed. "Cute." Wordy.	○	○ Descriptive. Accurate. Complete.	○ Terse. Arresting.	○
OPENING:	○ Abrupt. Little or no attempt to provoke interest.	○	○ Related to reader's common core of experience.	○ Creative, stimulating. Justified attention to topic.	○
PURPOSE/THESIS STATEMENT:	○ Omitted. Topic inappropriate or too broad. Vague or wordy. Not clearly focused. More than one sentence.	○	○ Clear, succinct, well-focused.	○ Compelling, challenging, generated forward momentum.	○
OVERVIEW OF ORGANIZATION:	○ Needed and not used. Vague, disorganized, difficult to follow. Unrelated to thesis. Mechanical.	○	○ Logical and clear. Related to thesis.	○ Included as integral part of thesis statement.	○
BODY (Quality Thinking)					
MAIN POINTS:	○ Not identified. Evident but not parallel. Inappropriate or illogical. Lacked substance. Thesis imprecisely or inadequately demonstrated.	○	○ Parallel ideas clearly supported thesis.	○ Balanced. Ideally related to argument and naturally arising from it.	○
SUPPORT:	○ Inadequate. Unrelated or irrelevant. Sketchy or repetitious. Excessive quotation or paraphrase to provide "filler."	○	○ Accurate, relevant, complete. No extraneous detail.	○ Comprehensive. Consistently reinforced argument.	○
ARGUMENT:	○ Incomplete. Only one aspect. Important aspects suggested but not treated. Evidence stacked.	○	○ Complete and convincing. Unbiased.	○ Innovative or persuasive. Reader led inevitably to writer's view.	○
CONCLUSION (Reinforcing the Discussion)					
SUMMARY:	○ Missing. Vague, incomplete. In checklist form. New material presented.	○	○ Smooth. Restated or reviewed essential ideas.	○ Reinforced or synthesized discussion.	○
RESTATEMENT OF THESIS:	○ Omitted or changed. Mechanical.	○	○ Restated so as to reinforce argument.	○ Transformed into genuine new synthesis or logical abstraction.	○
CLOSURE:	○ Omitted, indefinite, inadequate, or abrupt. Routine.	○	○ Definite and planned.	○ Fully integrated into overall pattern. Psychologically satisfying.	○

COMMENTS:

STRUCTURE AND STYLE (How it was Written)

LOGICAL SEQUENCE (Getting the Point Across)

PATTERN OF ORGANIZATION:	○ None evident. Awkward for this topic. Ideas not in logical sequence.	○	○ Clear and appropriate. Relationship between ideas precise and logical.	○	○ Arose naturally from topic and inseparable from it. Strongly reinforced thesis.
DEVELOPMENT:	○ Vague or incomplete. Imbalanced (some points developed, others not).	○	○ Clear, concise; facilitated the flow of argument. All points supported.	○	○ Strategy amplified argument at every point.
USE OF SOURCES:	○ Documentation omitted, partial, or improper. Evidence of plagiarism. Source used out of context or lacked credibility. Inaccurate or misleading. Wordy.	○	○ Credible and concise. Appropriate quotation and paraphrase. Experts properly qualified.	○	○ Testimony strongly reinforced argument. Ideal balance in types of proof or clarification support.
TRANSITIONS:	○ Missing, vague, or abrupt. Failed to show relation between points, paragraphs, or sentences. Mechanical.	○	○ Aided flow of argument. Led reader smoothly through argument.	○	○ Unobtrusively controlled progress of argument. Induced reader to accept conclusion as inevitable.

READABLE WRITING (Using the Building Blocks Properly)

DICTION:	○ Imprecise, vague, or unfamiliar. Pretentious or trite. Deadheads, smothered verbs, non-words, gobbledygook.* Overuse of jargon or acronyms. Impersonal or too abstract. *(See AFP 13-2, p. 2)	○	○ Clear, simple, concrete. Personalized use of pronouns.	○	○ Refined use of precise diction at appropriate level of abstraction. Effective use of plain talk.
SENTENCES:	○ Too long or short. Poor variety and subordination. Lack of parallelism. Confused verb tense. Vague pronoun reference. Substandard punctuation or grammar. Excessive passive voice.	○	○ S-V-O pattern whenever possible. Relaxed, informal style. Average length of 18 words. Consistent verb tense. Variety of length and pattern.	○	○ Direct, concise, unpretentious. Written to express not to impress.
PARAGRAPHS:	○ Poor focus. No topic sentences or organizing idea. Too short/long. Topic sentences not related to thesis or did not advance argument. Unsupported.	○	○ Actively contributed to clarity and forcefulness of argument. Effective alternation of levels of abstraction. Average of four to six sentences.	○	○ Mature. Ideal length and variety fully integrated into total argument.

MECHANICS

	Not Needed	Poor	Good	Excellent
Format and Neatness		○	○	○
Proofreading		○	○	○
Documentation Style	○	○	○	○
Bibliography	○	○	○	○

COMMON ERRORS (These errors reflect substandard usage. Each paper must meet a minimum standard to receive a passing grade.)

Sentence Fragment (subject or predicate omitted) _____

Run-on Sentence (two or more complete sentences joined by a comma or no punctuation) _____

Misuse of Semi-colon or Colon _____

Lack of Agreement between Subject and Verb _____

Incorrect or Indefinite Pronoun Reference _____

Possessives (no apostrophe) or Case Error _____

Misspelled or Garbled Words _____

TOTAL _____

FEEDBACK FOR STUDENT WRITING

1. Always keep in mind your purpose in giving feedback: to improve the student's ability to write. No matter how much you would like to edit or rewrite the whole piece, don't do it. There just isn't time, and it's the student's job to revise from your clear clues.

2. Strive for maximum objectivity. If you think something is wrong but you can't put your finger on the exact problem, don't bluff. Try always to be honest, fair, and unbiased.

3. Don't arbitrarily impose your own personal style or preference on the student. The comment, "I like it better this way," is not adequate justification for downgrading a student's work. If you can follow this comment with "because" or a reference to the Guide to AF Writing, you are on a much firmer ground. If what has been written communicates but you wouldn't have said it that way, let it be.

4. Judge the writing by its merit alone. You can't measure the amount of effort or amount of improvement.

5. Don't give undue emphasis to mechanical details such as punctuation, capitalization, and grammar. They are important but less significant than the quality of the thought. Most mechanical details are not vital to the communication process; they merely assist in it. When usage is divided about mechanics or spelling, be flexible--but be sure the student has the same form throughout. Encourage consistency.

6. Remember that good writing is hard work and that the writers have a justifiable pride in their efforts. Don't nitpick, wordsmith, or find fault just to be finding fault. Your feedback must be constructive to be acceptable. All writers have personal/social needs. If writing is loaded with errors, try to comment on the most important ones and deal with others at a later time.

7. Approach the feedback job systematically.

    a. If you can physically separate the parts of the paper, do so. For ready reference, place the table of contents or overview on one side and the notes on another.

    b. Read title or subject alone and see if you understand it. What expectation does the title arouse in the reader? Does the title give direction and a clue to content?

    c. On your first reading, attempt no corrections.

        (1) Instead, try to get a feel for the writer's focus and direction, the organization of main points, and the quality of the support. See if the conclusions or recommendations are justified. In other words, see if the writing as a whole adds up before you worry too much about the mechanics. Every time you spot a mechanical error, however, make a check in the margin.

(2) Before you read the paper the second time, jot down your impression of the paper's overall quality apart from mechanical deficiencies. Does the writing communicate? If so, why? If not, what are the distractors?

d. On the second reading, analyze why you made check-marks and identify the errors in the margin. Rewrite one or two items, if necessary, to show what you mean by the corrections, but don't get in the habit of a complete edit.

8. In grading writing, use your pencil as carefully as a surgeon's scalpel.

a. Don't be sarcastic, cute, or cryptic. Don't try to impress the student; try to improve the performance. When marking out words, be careful that you don't cross out something necessary to the writer's meaning.

b. Make your marginal comments meaningful.

(1) The comment "wordy" is not enough. Circle the unnecessary words and then add what is needed to complete the meaning.

(2) The comment "awkward" is not helpful. Be specific. Tell the student, for example, that the sentence is awkward because of a dangling modifier or a misplaced adjective.

(3) A question mark in the margin merely raises a question. If you find the sentence is confusing or ambiguous, point out where the confusion exists by asking a specific question or by suggesting a way to eliminate the confusion.

9. Don't be so concerned with "style" that you ignore the quality of examples or support material. Make sure, for instance, that the writer has transitioned smoothly into each quotation, using phrases like the following:

As the Secretary of State wrote in Foreign Affairs in the spring of 1973, " ________."

In 1942, a professor at Cornell summarized the problem as "________."

10. Use the standard proof reader's marks to avoid confusion.

∧	(caret)	Shows a space between∧words or $\overset{\text{an}}{\wedge}$ insertion.
⌣		Used to close in.
℘		Deletes punctuation~~;~~ a letter~~s~~, or a ~~word or~~ phrase.
⊓		Reverses letters, phrases, or words,
¶ or no ¶		Adjusts paragraphing.
/	(slash)	Downgrades a ~~C~~apital to lower case. To raise lower case to a capital, write in the letter.

SECTION E

THE STUDENT AS AN INDIVIDUAL

Chapter	Title	Page
27	Student Differences	27-1
28	The Dynamics of Small Learning Groups	28-1
29	The Instructor as a Counselor	29-1
30	Self Concept	30-1

The concluding section of the manual deals with the learner rather than the learning process. No instructional system can succeed unless the needs of the student are taken into account. We must address these needs whether we are planning for group or individualized learning. Instructors have a responsibility to establish a helping relationship with students.

Chapter 27

STUDENT DIFFERENCES

Ever since we were old enough to notice the world around us, we have seen that people differ. The physical differences are most obvious; psychological differences (personality, motivation, intelligence) are less obvious. Physical and psychological differences among individuals are important concerns in such areas as business, politics, and recreation, but they are especially important in education. Along with objectives, teaching methods, and evaluation, an understanding of our students is one of the most important factors in education.

While there is much research on student differences, firm conclusions are often hard to draw because of conflicting results. Often conclusions about student differences prove to be incorrect or only partially true as additional or more exacting research is conducted. Many educational decisions have been made based on faulty generalizations. Therefore, caution must be our guide as we examine this important area.

Most human differences cluster around some value known as the average. If we look at enough individuals, we find some above and below the average, resulting in a distribution known as the "normal" curve (note Chapter 25). Thus in measurements of differences in intelligence, the major clustering of cases occurs at a score of 100 (the mean). Intelligence quotients below 70 and above 130 are few in number compared to the cases at or near the mean of 100. Similarly, the clustering of cases on the individual difference of height recently reflected an average of 5'8" for adult males in the United States. When studying human differences, we use measurement techniques to obtain a range and distribution of scores and to describe how individuals differ.

Because students vary so widely on many important dimensions, instructors must be aware of these variations within a single classroom. Educators have normally taken one of two approaches in planning curriculums for students with a wide range of individual differences.

MATCH THE METHOD TO THE STUDENT

This approach recognizes that students differ in abilities and other characteristics that affect their learning. Instructors should not accept teaching methods and curriculums as they stand when they don't produce the desired learning outcomes. If a student or group of students have trouble succeeding under a given teaching method, the instructor changes or improves the method so that the students will succeed. Special efforts are directed toward helping students who are performing below the average. The instructor also tries to free above average students to move ahead at greater speed to capitalize on their special talents.

However, better teaching methods and means of reinforcing student behavior are not always practical. The costs involved and the difficulty of designing and implementing effective programs are among the drawbacks of this approach.

MATCH STUDENTS TO THE PLANNED LEARNING EXPERIENCE

This approach accepts the instructional system as it exists. Failure is minimized by using measures of student differences to predict success. Using tests and other evaluative data, forecasts are made in selecting, guiding, and admitting students to different curriculums, units, or courses of study. The school does not adapt its curriculum to the students. If students have too little ability to succeed in a school, course, or given curriculum, they are not admitted or are placed in an easier curriculum. This approach protects students by keeping them away from situations in which they are not likely to succeed. Information about student differences is used to predict and select. Only students with a high enough probability of success are admitted into the specified level or curriculum.

However, testing and evaluation instruments are often inaccurate or unreliable for predicting success. Students are forced to adapt to the teaching methods rather than having the methods adapted to their needs. Students who fail may not be as much at fault as the methods of instruction used on them.

COMBINING THE TWO APPROACHES

Some combination of these two approaches is probably superior to either one alone. If a teaching method is not succeeding with a student, then we should use another method. We should not consider teaching methods as fixed nor disregard abilities. We should look for some optimal match of students with methods. For students at one level of a given aptitude, one teaching method may yield greater achievement while for students at another level of that aptitude, a second method may yield greater achievement. For instance, a student with fairly low mechanical aptitude might profit most from one-on-one instruction, while a student with higher aptitude may learn as efficiently in a group using the demonstration-performance method. No longer would a search be made for the one best way to teach. Many ways to teach would be investigated, each of which may be "best" for particular types of students.

Too little is known as yet to make possible the widespread design of educational programs based upon a combination of these two approaches. Many educators, however, are currently attempting to meet this need. Instead of arguing about which of two teaching methods is best for everyone, chances are that both claims have some validity for some students. Because of student differences, no one method, test, curriculum, or version of any teaching-learning activity is likely to be equally successful with all students. Student differences and teaching methods interact to help or hinder learning. Ideally, we should never lose sight of the need to monitor and then match students to methods in some fashion that best fits the individual student.

As we attempt to match methods to student differences, we need to have a basic understanding of group and individual differences and our ability to affect them.

GROUP DIFFERENCES

People are often grouped and studied on the basis of their age, sex, race, or background. When differences are found, they are referred to as group differences. For instance, school officials might gather data to compare achievement of male and female members at a military academy or the success rate of black and white undergraduate pilot trainees. Managers might draw conclusions from the accident rate of Air Force pilots under 30 years of age compared with that of pilots over 30.

The results of research on group differences are often of limited use to educators because of the controversy they generate or because one study often conflicts with another. However, useful, tentative conclusions are being drawn in some areas of study, with implications for classroom instructors. For instance, much research has investigated sex differences in the classroom. Although differences in verbal, visual-spatial, and mathematical ability have been found between the sexes, the cumulative research on ability and actual school achievement does not offer sufficient evidence for treating adults differently based on their sex. More important, current findings suggest that instructors should not hold different expectations of cognitive performance for the sexes.

While the extensive amount of research on group differences cannot be summarized in this chapter, here are some guidelines for dealing with these differences in the classroom.

Work to Eliminate Stereotypes

Stereotypes are oversimplified, rigid beliefs about categories of people. These beliefs tend to be invalid because they are overgeneralizations. If we believe that all NCOs conform to the image of the drill sergeant, all second lieutenants are naive, all civil servants are dedicated, or all fighter pilots are adventuresome, then we are guilty of forming stereotypes. Today, many work positions are filled (and wages set) based upon stereotypes that are fostered by such innocent means as textbooks and TV shows. These communication mediums often show groups of people in stereotypic roles. Such portrayals and the values they project may actually interfere with or prevent personal growth for members of these groups.

While there is no easy way to eliminate stereotyping from our behavior, we need to make a concerted effort to eliminate the hundreds of subtle, seemingly innocuous ways in which people are treated based only upon their sex race, age, or background. These unsupported beliefs about people can do great harm. An awareness of our own use of stereotypes is a good place to start. Then we should examine these stereotypes and decide how they might be influencing our behavior in the classroom. We should then work to eliminate these unsupported beliefs about people and the influence they might have on our behavior.

Use Caution in Using Group Averages

Suppose we read a research article which indicates that adult males are superior to adult females on visual-spatial tasks, or that adult females are superior in tasks which involve understanding and producing language. How might this information have a negative effect on our relationships with students?

When we speak of group averages or group characteristics, we should be extremely careful in applying these figures or descriptions to an individual student. While the average height of adult males may be 5'8", this average certainly means little when dealing with a 6'4" student in our class. Similarly, great care must be taken on using knowledge that males are superior to females on visual-spatial tasks. Individual students in your class may deviate from the average of their group, and the women may surpass the men in achievement in that particular class. Additionally, expectations come into play. If we expect female students to outperform males in a language class, our expectations may influence actual performance. Students often perform to the level of their instructor's expectations.

If we are tempted to apply group averages to individuals, we might consider the comment of a famous British writer who was once asked, "Who has the most brains, man or woman?" His reply was, "Which man? Which woman?" Instead of treating students as members of a group, we should treat them as individuals.

Recognize an Instructor's Limitations

When we focus on group differences in our classrooms, we soon realize that they are a fact of life we cannot change. We cannot alter a person's age, sex, race, or background. Most students do not want to be treated differently based upon their group membership. Therefore, we can make certain that we do not say or do something that will probably offend or cause them to lose interest. At the same time, they deserve to be respected for who and what they are.

In summary, we should be very careful when basing educational policies and classroom practices on group differences.

INDIVIDUAL DIFFERENCES

Our students will arrive with different personalities, varying motivation, a wide range of past achievements, and differing abilities. There is little we can do about their past achievements or personalities. However, we can provide an environment in which they will be motivated and opportunities for helping them make the best use of their abilities.

Differences in Motivation

Probably the individual difference that will be of most concern to Air Force instructors is motivation. Motivated students learn more effectively. Unmotivated students are likely to be a disturbing influence on others. Some students will possess an inner motivation, while others will be motivated to learn only when external rewards are offered--such as grades or the opportunity to be a distinguished graduate. Certain students will memorize the textbook if you ask them to since they want to please you. Some students will strive for excellence in all aspects of a course, while others will exert only enough effort to meet the minimum criteria for passing.

The Concept of Motivation. Psychologists use the concept of motivation to account for changes in, and for the frequency and vigor of, a person's activities. We are always doing something, but some of our activities occur more often than others and/or continue longer when they do occur. Additionally, some activities are pursued more vigorously than others. Outcomes that usually give rise to pleasant feelings will be pursued; those that usually give rise to unpleasant feelings will be avoided. While a motive cannot be observed directly, when it is activated by a situation we can see its effect on behavior. We say persons are motivated or we speak of their motivation.

The concept "motivation" is complex and can be viewed as encompassing other closely related concepts:

- Needs. When students have a need, they lack something that a given activity or outcome can provide. The need to belong, for instance, can motivate a student to seek group acceptance.

- Interests. If students have an interest in a subject, they tend to pay attention to it. The student who is interested in computers is more likely to pay attention to instruction in that subject.

- Values. Students with a particular value have an orientation toward a class of goals considered important in their lives. A student who values patriotism will most likely be motivated in a lesson on the flag or the Code of Conduct.

- Attitudes. Attitudes consist of feelings for or against things (people, objects, ideas). If students like mathematics, they get pleasure out of activities involving mathematics. Students seek activities toward which positive attitudes are held. Attitudes direct and arouse purposeful activity.

- Incentives. Incentives can satisfy an aroused motive. Incentives such as good grades, awards, and selection as a distinguished graduate motivate students who want to achieve.

- Aspiration. Aspiration is the hope or longing for achievement. A certain level is needed if the student is to make an effort. For instance, the military student may aspire to be a college graduate and be willing to devote evening hours to completion of degree requirements.

Achievement Motivation. The concept of motivation helps to explain why students with the same scholastic aptitude or intelligence perform differently in our classrooms. When students achieve beyond their predicted capability, we speak in terms of overachievement. When they achieve below predicted capability, we say they underachieve.

It will not take us long to note that our students differ in achievement motivation. Students with high and low achievement motivation will perform differently on tasks when working independently. Students low in achievement motivation will need more of our assistance in the form of supervision, direction, and structure. Highly motivated students will require little encouragement or direction when working in areas they value.

Students high in achievement motivation will persist in task completion and have the desire to complete interrupted tasks. They also have the desire to keep up orderly progress toward distant goals. During group activities, instructors will find them wanting to work with partners who can get the job done.

Fear of Failure. Not all student motivation comes from the desire to succeed. Some students will be motivated by the fear of failure. In the past, students may have experienced shame, ridicule by peers, or punishment for failure. The resulting fear of failure may be more motivating than a desire to do well. The fear may even keep students from attempting certain activities, or they may be motivated to attempt unrealistic tasks.

Suppose your course uses programmed instruction with its emphasis on errorless performance. You may find a decrease in motivation among students whose motivation to succeed is higher than their fear of failure. However, you may see an increase in motivation among students whose fear of failure is higher than their motivation to succeed. If you use strict grading with your students, those whose motivation to succeed is high should be more motivated. Worse performance will probably result among students whose fear of failure is greater than their desire to succeed.

Affiliation, Power, and Approval. Some students will be motivated by the want and need of friendly relationships with other persons (affiliation). By mixing teaching methods, we can provide opportunities for these students to participate in small groups. Others will be motivated by the desire to influence other persons (power). Opportunities for leadership in group activities can be provided, or we may need to counsel these students on their tendencies to dominate or manipulate others as a cause for their being disliked. Other students will have strong needs for recognition or approval. We will have to give special attention to this group in our counseling program. We can provide opportunities for these students to participate in classroom activities where their particular talents can be recognized.

Motivation and Reinforcement. From the viewpoint of psychologists who emphasize the role of reinforcement in learning, all of us are motivated by the reinforcing consequences of our past behavior. Our motivated students may not have strong motives to learn nor be driven by powerful drives and needs. Rather they may be students who have been properly reinforced for certain behaviors in their past. The students may have been rewarded in the proper amount and at the proper time when a certain behavior was exhibited. The truly motivated student may be the person who has learned to get along for long periods of time without much apparent reinforcement. From the behavioral perspective, we can motivate students by a great deal of reinforcement in the early stages of learning (for instance, praise for each correct answer) followed with a gradual thinning out or lowering of reinforcement as the student matures.

Frustration and Motivation. Incentives such as grades, awards, and distinguished graduate programs provide a degree of control over most students because the expectation of reinforcement is usually met with actual reinforcement. But what happens when such expectations are not reinforced? Suppose we have students working for good grades, wins in some form of athletic competition, or verbal praise. In the past we have reinforced this behavior with these incentives. But suppose we stop these incentives. The students' behavior may show changes in energy and direction leading to frustrated behavior. Expected grades are not received or the students do not or cannot score points for their team. Or students may be moved from a group in which they are doing well to one in which they do not receive their expected reinforcement. Frustration results. Similarly, keeping students from finishing a task they are engrossed in because time ran out leads to frustration. Eliminating students from athletic competition with their peer group because their peers are too skilled blocks their chances for reinforcement.

Frustrating situations like these motivate students because they change student energy level and direction. However, the motivated behavior is usually in a socially undesirable direction resulting in emotionality, withdrawal, regression, overactivity, and aggression.

As instructors, we should guard against frustrating situations. When we see signs of aggression, withdrawal, or inappropriate displays of emotion exhibited by our students, we should regard such behavior as a cue to the occurrence of frustration. We should make an effort to determine the source of the frustration.

Techniques for Motivating Students. Educational research suggests that the following techniques are useful in motivating students:

- Verbal Praise. Words such as "good," "great," and "fine" work as powerful motivating devices when given after a proper response/performance, or after a close approximation of a proper response/performance. Verbal praise is easy to use and serves as the most natural of the motivational devices available to an instructor. Praise given after certain behavior increases the frequency of that behavior.

- Written Comments. Studies indicate that a short, encouraging note based on a student's test performance has a more positive effect on future test performance than a grade alone or a brief comment such as "Excellent: Keep it up." However, brief comments are more effective than grades alone in motivating students to do better on future tests.

- Grades. Students have learned that benefits are associated with getting good grades. Consequently, giving tests and assigning grades have come to have the effect of motivating students to learn. Not only do grades affect what is learned, they affect how much is learned. They become incentives and reinforcers.

One of the strongest arguments against using tests and grades as motivators is their link with anxiety. When a student's anxiety is very low or very high, test performance is lowered. Almost always, very high anxiety will hurt performance. However, moderate anxiety motivates in a beneficial way; it assists performance. For students high in anxiety, we should seek ways to lower it in the classroom. For those low in anxiety, we might find ways to raise it to improve performance.

When students receive either a pass or no credit for a course instead of conventional grades (A-F), the result may be decreased effort. Some students may do less work. However, many students and faculty members frequently mention the positive consequences of this type of grading system. There is less pressure on students, they can experiment in new areas, and a healthier attitude develops toward the course. These benefits may outweigh any reduced quality or amount of student achievement occurring under a pass or no credit type of grading.

- Creative Behavior. Doing the unexpected or something novel has the effect of motivating by arousing the student's curiosity. One Air Force instructor established a reputation based upon this technique. During a class period, this instructor might appear as an old West gunfighter to emphasize points. The next day the instructor might be dressed as an astronaut. Students looked forward to classes because of the unexpected. Instructors might turn the tables and ask students to prepare a test for them to take. Or students can be asked to prepare test questions for use on the next exam. In a case study, the instructor might vary the approach by giving students several solutions to the problem and asking them to determine which is the best.

- Periodic Reinforcement. Providing reinforcement to students as a course progresses can keep them motivated to the end. If we make early stages of a learning task easy, students will have some initial success in task accomplishment. We should introduce the difficulties and complexities of a task gradually and insure that all students have a chance for reinforcement, so their appetite will be whetted. This action will require us to know the variety of talents and skills possessed by our students.

- Familiar Examples. In Chapter 6 the value of examples as support material was developed. When examples are based upon the experiences of your students, they serve to motivate.

- Building Block Concept. Building upon what has previously been taught is motivational. Using the cognitive taxonomy of learning, we build upon prior instruction. When students see how we use prior instruction to build the current lesson, the effect is motivational. We should emphasize that the material we are now learning does not stand in isolation. We will be using it again later in the course or unit of instruction. Whenever possible, we should call upon previously acquired facts, concepts, and principles to develop a current lesson.

- Computers, Simulations, and Games. In addition to dealing with higher levels of learning in the cognitive domain, the use of simulations, games, and computers can be fun, may provide important learning experiences, and usually keeps students highly involved and motivated. Using and even developing such devices are an almost sure way to increase classroom motivation.

- Classroom Leader Support. We should try to get the leaders among the students to adopt the goals and objectives of the course. If the formal and informal leaders--not always the same person--in a class support us and our efforts, other students will be motivated to do likewise.

- Unpleasant Stimuli. The list of unpleasant stimuli to avoid is long and includes items such as having students sit too long in an auditorium, having them try to listen in a room with poor acoustics, putting them too far away from a chalkboard or screen, not telling them how they are doing in the course until it is too late to do something about it, or not meeting their requests for help. These stimuli have a negative effect on motivation and should be eliminated.

As we work to motivate students and find techniques that work, we should take the time to annotate our lesson plan so the techniques can be used the next time the lesson is taught. If a motivational technique does not work, it should be dropped from the lesson plan. In time we will have a lesson that motivates as well as teaches.

Differences in Ability

During the 1920s, the testing movement revealed a wide range of student intelligence quotients in typical public school classrooms. Studies indicated that the brightest students could move at a more rapid pace and learn much more than less able students. The findings raised questions about accepted teaching methods and indicated that many materials, texts, and topics were inappropriate for some students. Educators concluded that any attempt to teach students in a group would likely miss the mark for some students. The findings greatly complicated the task of teachers.

As a solution, educators turned attention to individualized instruction. Students should work on tasks appropriate to their particular abilities. To the extent possible, they should move ahead at their own pace. Accounting for individual differences in student ability became one of the primary purposes of individualized instruction.

Individualized instruction occurs when the goals of instruction, learning materials, subject matter, or methods of instruction are specially chosen for a particular student or a small group of students with common characteristics. The members may be placed in a special seminar and the academic program tailored to their special needs.

In the discussion of individualized instruction that follows, instructional approaches or methods that can be used by the classroom instructor are presented. Individualized methods that typically require a reorganization of the school's curriculum are discussed in Chapter 19, Visual Aids and Instructional Media.

Independent and Self-Directed Study. Air Force instructors may have an opportunity to allow students to work on their own as a supplement to, or replacement for, segments of a course. When this opportunity exists, instructors can provide a student or small group of students with an assignment that lasts for a few hours, several days, or weeks. Students may not be required to attend formal classes during this period.

If we use this approach, we should insure that students clearly understand the objectives, resources available, tasks steps involved, time allotment, and evaluation techniques prior to the start of the study. The degree of supervision given depends on the maturity and objectives of the students. We may need to supervise and guide the students fairly closely, or they may work almost entirely on their own and be responsible for a finished product which we will evaluate.

Research on self-directed study suggests that most students will need some guidance, even if they are going to work independently. Many students are not ready for intellectual independence and will complain if thrown unprepared into an extreme form of self-directed study. The method seems to work best in more advanced courses where students have previously dealt with the same material at a basic level.

As instructors, we need to be aware that initial student reaction to self-directed study courses is often unfavorable. However, students do develop more favorable attitudes toward future opportunities for intellectual independence. The unpleasantness from initial exposure to this approach probably comes from the big change in teaching methodology. But the broadening experience eventually makes students accept more independent work. We should keep in mind when using this approach that the unfavorable initial reaction may last and could affect student response to any additional self-directed studies.

Contracting. One variation of the use of independent and self-directed study involves use of contracts between individual students and the instructor. The approach can be used for a total course, as a means of supplementing a basic course for all students, or for use with selected students. A contract involves an agreement, usually written, between the instructor and student. A learning contract between you and a student might contain these elements:

- Objective. Specify in the contract the specific objectives to be achieved.

- Evaluation Techniques. Agree upon the formal means of evaluation whether a test, oral or written report, or a project.

- Resources Available. Make the student aware of available resources for starting the learning experience.

- Task Steps. Establish a series of task steps leading to achievement of the objectives.

- Checkpoints. Meet periodically with the student to discuss problems and progress. These meetings serve to motivate the student.

- Deadlines. Establish and require the student to meet realistic deadlines. If the student fails to meet a deadline, counseling is usually required. Renegotiate the contract, if necessary.

- Reinforcement. When possible, reward the student for contract completion. An opportunity to brief others, participation in a conference, or an opportunity for extended study in an area of interest might serve as the reward.

Mastery Learning. This approach to individualizing instruction operates on the premise that time is a crucial variable in the learning process. In using this approach, the instructor fixes the degree of learning expected of students at some mastery level and allows time for learning to vary, so all or almost all students achieve the desired level of mastery.

Mastery is defined in terms of a specific set of major objectives students are expected to exhibit by a subject's completion. The subject is then broken into a number of smaller learning units. Unit objectives are defined whose mastery is essential for mastery of the major objectives. Students are allowed to demonstrate mastery of a unit at any time they choose. Brief diagnostic (formative) tests provide feedback to the students and instructor. When unit learning problems are identified, supplementary instructional correctives are applied to help students. These correctives involve use of small group problem sessions, individual tutoring, alternative textbooks, workbooks and programmed instruction, audiovisual methods, academic games and puzzles, and reteaching. The students demonstrate achievement of course objectives through end-of-instruction (summative) evaluation. The instrument used defines mastery in terms of a specific set of skills each student is expected to have learned by the subject's completion.

The mastery approach is very student oriented. Students are graded solely on the basis of the final (summative) examination performance. Grades are based upon performance against a predetermined standard and not relative to peer performance. All students who attain the standard receive appropriate grade rewards and there is no fixed number of rewards. Students are given constant feedback through a series of ungraded, diagnostic-progress tests, and each student is given all the help needed to learn. The mastery learning approach is particularly effective when students have a wide, but manageable, range of entry skills.

While the mastery learning approach has high potential, there are limitations. First, the approach works best when the course requires minimal prior learning or previous learning which most of the students already possess. We would not want to institute the approach in an advanced course if most of the students did not possess certain basic skills or if time or money did not permit us to modify the instructional design to take this into account. The approach may not be able to offset the negative effects of deficient prior learning. Second, the approach has been most successful for subjects which are sequentially learned. The learning of a unit builds upon the learning of all prior units. Finally, the subjects in which mastery learning strategies are most effective have tended to be those for which there is a single definite right answer to each question.

Personalizing Instruction. One approach that appears to work successfully with adults involves personalizing instruction. Built upon the following concepts of independent and self-directed study, the personalized instruction is supplemented with traditional instructional techniques.

- Individual Pacing. Students can rapidly complete a course, often using a fraction of the time required for group instruction. Or they may use more time than is allotted for traditional instruction within constraints imposed by the administration. Students work to meet established criteria and do not compete against each other.

- Mastery Oriented. Before students can progress to new material, they must demonstrate mastery of a particular area of instruction. Students are not penalized for failure. If failure occurs, students study the material again before retesting on a parallel form of the test. They continue the cycle until mastery is achieved, which usually means 80 percent or 90 percent correct responses. When students finish the unit of work, a new study guide is provided for the next unit.

- Tutoring. More advanced students can often serve as tutors for those needing assistance. Encouragement and support are provided.

- Study Guides. Students are provided with study guides for each unit. The guides contain unit objectives, study references, suggestions for study, experiments and projects that can be undertaken, and sample test items.

- Supplemental Materials. Lectures, demonstrations, discussions, teaching interviews, case studies, and movies can be provided for motivation or clarification. Normally students attend on a voluntary basis.

Courses taught using these guidelines for personalizing instruction show promising results. Student reaction tends to be positive and examination scores are higher than in courses conducted in a traditional manner.

We should attempt conducting such a course only when we have carefully determined the objectives which define the competencies desired in students at the end of instruction. The objectives provide clear goals, and students know what they are responsible for. This knowledge can help overcome negative feelings about the lack of structure that often accompany participation in independent-study programs. Many students like the self-pacing which allows them to study where and when they please. They also like the personal interaction with the tutors.

Cognitive Learning Style

Students learn in many ways. They perceive, think, and solve problems differently. The general patterns students use as they perceive, think, and solve problems can be called their cognitive style or cognitive learning style.

Research on learning is beginning to identify several distinct styles of learning which can affect how much and how well students learn. There are several models for analyzing cognitive learning style in current educational literature. Some deal with preferences students have for learning through passive listening rather than active participation. Other models attempt to link self-concept with willingness to accept group norms or to take risks. Many other personality characteristics are included in these models, and there is considerable research to suggest that various aspects of cognitive learning style should be explored further.

Many schools, particularly at the community college level, have employed an analysis of cognitive learning styles for placing students into courses taught differently. There does seem to be an improvement in grades and a reduction in anxiety when students and their learning experiences are matched on the basis of cognitive learning style. There is very little that individual instructors can do, however, to take advantage of differences in learning styles in typical classrooms. Some of the models for determining learning style are very theoretical, and many of the techniques are very sophisticated, time consuming, and expensive. Further, if a cognitive learning style can be determined, we have the additional problem of matching several alternative ways of teaching to the many and varied student cognitive learning styles.

The growing interest in cognitive learning style may yet be one of the most fruitful approaches to dealing with individual differences in the classroom. Like so many other attempts to deal with students as individuals, however, the fate of cognitive learning style analysis will depend on results as compared to costs. The approach appears to deserve further serious study from what we have learned so far.

Those interested in pursuing cognitive learning style analysis further should review the literature, particularly that of Hill and Nunnery, Claxton and Ralston, and Hunt. Several civilian schools have considerable experience in attempting to implement this concept, particularly Oakland Community College in Bloomfield Hills, Michigan and Mountain View Community College, Dallas, Texas.

SUMMARY

One of the basic themes of psychology is that of human differences—no one is exactly like anyone else. These differences complicate the task of classroom instructors, but they also provide the challenge.

Many educators have chosen to adapt the system to account for differences in abilities and other characteristics that affect student learning. Teaching methods are changed or improved so students can succeed. Other educators have chosen to accept educational systems as they exist and try to minimize failure by admitting students who will most probably succeed. Each approach has shortcomings so attempts are being made by educators to synthesize the two approaches to overcome the effects of student differences.

As classroom instructors, there is not much that we can do to overcome group differences based on sex, age, race, or background. However, we can work to eliminate stereotypes based on these differences, use caution in interpreting group averages, and recognize our own limitations in coping with these differences.

Students vary in their motivation. Many students are motivated by the need to achieve, while others may be motivated more by a fear of failure. The want and need for affiliation, power, and recognition also serve to motivate students. Frustration can motivate students, but the motivated behavior is usually in a socially undesirable direction.

Techniques for motivating students include: verbal praise, personal notes on their test performance, grades or similar rewards, creative behavior on the part of the instructor, reinforcement at appropriate times, use of familiar examples, building upon previous instruction, obtaining classroom leader support, avoiding unpleasant stimuli, and use of computers, simulations, and games.

Differences in ability in a classroom may be met through such means as independent and self-directed study, contracting, mastery learning, and by personalizing instruction.

Chapter 28

THE DYNAMICS OF SMALL LEARNING GROUPS

Appropriate teaching methods are a continuing concern of Air Force instructors. The formal teaching lecture, for example, may place students in a passive role and fail to provide enough incentive or motivation for students to learn. On the other hand, self-paced or individualized instruction which often provides more incentive or motivation may not be feasible.

Small Learning Group Defined

Small group learning is a way of overcoming limitations of some methods while promoting verbal and nonverbal interaction among instructor and students. A small learning group is a collection of students sharing a common learning objective and occupying a space so limited that there can be direct verbal and nonverbal communication among them. A small learning group might consist of as few as three or as many as 20 students. The upper boundary is arbitrary, but if there are many more than 20 persons, the benefits of small group learning are reduced.

The demonstration performance, guided discussion, and case method discussed in this guide are instructional methods designed for small group learning. In addition, all of the other student verbal interaction methods, some of the presentational methods, and most of the application methods discussed in Chapter 9 involve small group learning. Each method helps students become socialized and to adjust to the learning environment by promoting interaction in the classroom.

Process vs Content

Simply forming small groups of students, however, does not guarantee effective group learning. In all human communication there are two major ingredients--content and process. The first deals with the subject matter or the task the group is working on. In most learning settings, the focus of attention of all persons is on the content. The second ingredient, process, is concerned with what is happening among members while the group is working. Group process, or dynamics, deals with such items as norms, cohesiveness, consensus, individual roles, group feeling, needs, and leadership. In many learning groups, too little attention is paid to process, even though it is a major cause of ineffective learning.

Analysis of verbal behavior in learning groups indicates that about half of the discussion focuses on process and half on content. Certainly educational content is of prime importance, but process statements that encourage a group's progress are also important. Attention to process serves to keep students on track by orienting the discussion and satisfying their personal and social needs. Sensitivity to group process will help an instructor diagnose students' problems early and deal with them more effectively.

Benefits of Small Group Learning

Although small group learning has some limitations--such as the higher cost of a smaller student to instructor ratio--the benefits generally outweigh the limitations. Here are some benefits of small group learning: (1) Most students tend to perform better on many cognitive and skill-oriented tasks when working with others in small groups. The presence of others working on the same problem increases motivation to perform well. This motivation may be lacking with either large groups or individualized learning. (2) Students can gain a clearer understanding of the material when they interact with the instructor and other students. Since much informal learning occurs in families and other groups, students are accustomed to learning in groups. (3) Most students enjoy interacting with others in social, recreational, and educational groups. Satisfaction and enjoyment of learning is increased when participating with others. (4) Students often learn faster in groups than individually. Obviously, such factors as content matter and individual motivation influence whether individuals learn faster in groups.

In spite of these positive influences that a group can have on students, there are other influences that may or may not be beneficial. For example, membership in a group places much pressure on individual students to conform to group norms.

Norms

Every group develops norms—shared expectations of conduct and participation that guide and regulate group behavior. Norms reflect how students speak, to whom they speak, where they sit, what the classroom activities are, and what the limits are for expressing their own attitudes and values. Usually such norms are not even stated, but are still readily apparent to students who have been in the class for even a short time. In a large lecture class, for instance, instructors have greater responsibility for determining norms than in smaller groups where students and instructor can interact more easily. On the other hand, in small groups instructors must be particularly careful not to impose norms on the group unnecessarily. Group atmosphere or feeling will be improved if students are allowed to help develop norms.

Classroom norms become apparent in two ways: (1) certain behaviors either recur often or are avoided and (2) punishments or sanctions are taken against persons who deviate from the norm. Others may frown, ignore, or even comment negatively about the behavior. Some norms are productive: "Students should relate their comments to what has been said previously." "Students should arrive at class on time." "The instructor should include all students in the discussion." Some norms, however, are largely counterproductive: "Students should talk about whatever they want." "The instructor should 'put down' students who express different points of view." "The instructor and students do not need to prepare for class."

Students must conform to productive norms if they are going to learn efficiently in groups. If productive norms are clearly understood but violated by one or more students, then other class members will generally act to bring violators in line. They many exert pressure by talking to them directly. Usually the first comments are light and humorous, but if gentle teasing and light comments do not change the behavior, the language may become more biting and satirical. Instead of laughing with the nonconformists, others begin to laugh at them. If the member still does not conform, direct ridicule and finally rejection of the nonconformist may result. Obviously, the instructor should take action to prevent behavior that may threaten cohesiveness of the learning group.

Cohesiveness

Cohesiveness, or the ability of a group to stick together, is essential in small group instruction. Cohesive groups--groups where students have high group loyalty--exhibit higher morale, greater productivity, and more communication.

1. Morale. The morale of members is related closely to cohesiveness. If the group is important to them, students pay attention to its problems and get more involved in the subject matter. They spend more time on behalf of the group and want others in the group to do well.

2. Productivity. Cohesive learning groups are more productive because class members help one another. If one student is having trouble, others often offer to assist. Students in groups with little cohesiveness often lack initiative and have to wait for instructions from the instructor. They often do only what they are told and no more.

3. Communication. Cohesiveness encourages communication among students and between students and instructor. Students feel secure as a part of a group and are not afraid to speak up. The instructor and class leader do not feel threatened when questions are asked. Everyone is interested in the welfare of the group. Groups lacking cohesiveness may be quiet, polite, boring, and even apathetic. Cohesive groups tend to be noisier, are characterized by more disagreement, and often run overtime since there is generally a good deal more discussion on each point raised.

Increasing Cohesiveness

With small group interaction we want to increase cohesiveness because cohesiveness promotes learning. Here are some steps for improving cohesiveness in the learning group:

1. Set obtainable objectives. As discussed elsewhere in this guide. clear obtainable objectives are important to efficient planning and teaching. Course objectives, objectives for large blocks of instruction, and individual lesson objectives not only enhance learning but also increase morale. Achieving an objective rewards a group. Making daily and weekly progress rewards the group regularly. Of course, for objectives to build morale, they must be clearly specified and understood by all. And they must be obtainable.

2. Reward the group. Reaching an objective is in itself a reward for the group, but the instructor can provide incentive and promote teamwork by rewarding the entire group for achieving a goal. Praising the class for good work and planning social affairs recognizing a job well done are ways of rewarding the group. Many classrooms are geared entirely toward rewarding only individuals. Yet as any athletic coach and most experienced teachers know, encouraging persons to look out only for themselves to the exclusion of others leads to trouble. The wise instructor uses both individual incentives and group rewards to enhance small group learning.

3. Build a group tradition. As discussed earlier, once a group is established, norms develop. Norms are a part of group tradition. Other things also happen. Unusual, humorous, or otherwise memorable incidents become a part of the group's history and tradition. By recalling such incidents at class meetings an instructor emphasizes that the group exists over time. Highly cohesive social organizations such as churches and service clubs enact ceremonies and traditions over and over. One instructor built a group tradition and aided cohesiveness by slipping into the classroom early each morning to write a little saying on the chalkboard. When the instructor failed to do so one morning, the seminar group was genuinely disappointed.

Consensus

Certainly cohesive groups will express disagreements more openly than less cohesive ones. Such expression is both desirable and expected. But there comes a time when consensus or agreement on issues must come if closure is to result. In learning groups as with other types of groups, success can generally be measured by the group's ability to reach its objectives. Although consensus in the sense of unanimity may be nearly impossible to achieve, there are some guidelines the instructor can follow to help the group reach general agreement.

1. Clarify the discussion. Make sure that the group's activity is understandable, orderly, and focused on one issue at a time. Consensus comes more easily if each of the factors is weighed individually and systematically. Encourage each student to stick to the subject, to avoid side discussions, and to clarify the issues with questions, so that everyone can have equal understanding. Instructors can keep the discussion focused and prevent the introduction of extraneous or unrelated matters.

2. Use process statements. As suggested earlier, process statements deal with what is happening in the group. While process statements may relate to the content, they serve primarily to stimulate and facilitate discussion: "What you've said seems to make sense. How do the rest of you feel?" or "So far we seem to agree on the first two points. Let's move on to the third," or "Have we heard from Joe yet?" or "This is really a productive discusssion." Questions that ask for clarification and statements that get the class discussion back on track are also types of process statements. When both instructor and students use process statements effectively, agreement will come more readily and learning will be increased.

3. Seek different views. All students should be encouraged to present their views and provide information and evidence to support their views. Expression of a wide range of opinions and views allows a great opportunity for learning to take place. At the same time participation by all students will allow them to have their voices heard and will increase their satisfaction with the discussion and conclusions reached.

4. Remain open to different views. This suggestion is clearly the corollary to the preceding guideline. We have all known people who seek the views of others with no intent to be influenced by them: "Don't confuse me with the

facts; my mind is made up." When others present irrefutable facts and figures, or even a good idea that you may not have thought of before, don't be afraid to alter your position or admit that you may have been wrong. Good instructors often learn from their students. Also instructors can serve as models for the behavior of students in the matter of not being overly opinionated. Studies have shown that low or moderately opinionated instructors and students are held in higher esteem by others than highly opinionated ones.

5. Use group pronouns. Studies show that less cohesive groups--groups which are less successful in reaching consensus--tend to use more self referent words, such as I, me, my, and mine. Groups which reach consensus and are more cohesive, on the other hand, are more apt to use group referent words such as we, our, and us. As an instructor, talk about the seminar or class as a group. Talk about what we hope to accomplish, and how we can work together to achieve our objectives. Do not emphasize what I want done or what is best for my interests. Stress that while all students should be concerned with their own learning, they should also be interested in the learning of others in the group. The roles each student assumes can help with effective functioning of the group and with creating an atmosphere where learning can take place.

Class Member Roles

In all small learning groups students begin to play different parts or roles after they have been together for a while. When a student becomes comfortable with a role and the rest of the group offers rewards for assuming the role, that student has found a place in the group. The student expects to play the role and others expect it too. This situation is comparable to roles in plays, and interestingly, just as people play different roles in different plays, they also play different roles in different groups. The gregarious life of the class may be quiet, devout, and reserved in church. The person who is ill-tempered and bossy at home may be a likeable even-tempered person in the classroom. A student may be outspoken in one class and a good deal more reserved in another where the content matter is less familiar. But here is the basic principle: A student's role is worked out jointly by the student and the rest of the group.

Student behavior in learning groups is similar to role behavior in other small group situations. Obviously there are many different roles and one person might fill more than one role in a group. Some task roles found often in learning groups are (1) idea-initiator--proposes new ideas, new goals, possible solutions; (2) information giver--offers facts and information, personal experiences, and evidence useful for the group; (3) coordinator--develops, describes, and shows relationship among facts, ideas, and suggestions. Common roles for group maintenance are: (1) supporter--agrees, praises, shows warmth and solidarity to others; (2) harmonizer--mediates differences between others, finds common ground, reconciles disagreements, conciliates, and suggests compromises; (3) tension reliever--jokes, points out humor in the situation, and puts other at ease, perhaps by reducing formality and status differences.

Dealing with Nonproductive Roles

Instructors are pleased to have students assume productive roles like those described in the preceding paragraph. With students like these, the learning group becomes more productive for all its members. Often, however, instructors are faced with the problem of students who play nonproductive roles. Here are some common problems and suggestions for dealing with the problems.

1. Monopolizers talk too much and hinder participation by others. If they know a lot about the subject and are eager to be helpful then don't embarrass them for you may need them in this role later on. Do not, however, let them monopolize or give long speeches. Politely turn the conversation to another student by asking a direct question. Do not use an overhead question (a question asked of the group as a whole) for most likely a monopolizer will answer. If monopolizers are simply trying to impress others with their knowledge or status, encourage them only when their comments are productive; otherwise, politely interrupt them and move to another student or a different topic. Generally other members of the group will handle the problem for you. Give them positive reinforcement when they do.

2. Arguers take issue with what the instructor and other students say. They may simply have strong personal convictions about the topic. If this is the case, don't close your mind to some possibly good ideas just because of the opinionated manner in which they are presented. Talk to arguers outside of class and explain that while you consider their views important for the group to consider, they must not hinder overall group effectiveness. Of course, if is possible that arguers are attempting to gain recognition or perhaps even attempting to disrupt the group. Try not to get too excited and above all don't let the group become antagonistic. Remember that the group is at least partly responsible for a person playing this role. You may want to talk to other students outside of class and ask them what they think can be done to understand the person and help change the behavior.

3. Nonparticipants show reluctance to participate verbally in class discussions. Although nonparticipation may result from not being prepared, often students don't participate because they feel insecure as individuals or insecure with the particular group, perhaps due to perceived status or rank differences. Spend extra time with these people outside of class. Discover their interests. In class, ask such students direct open-ended questions. Make certain the question can be answered easily, but not with either a "yes" or "no" response. When these students take part in the class discussion, give positive reinforcement. Say something such as, "That's interesting, Mary. We need to hear from you more often," or "I hadn't thought of it that way before. Good answer."

4. Clowns don't take things seriously and as a result distract others and hinder learning. These students generally enjoy attention. Encourage them when tensions mount. Laugh and let them know you admire their humor. Ignore them when "clowning around" is not appropriate. They will not like to be ignored and will soon learn when to supply humor and when not to.

Dealing with Nonproductive Groups

Occasionally instructors find that rather than having problems with individual students they have problems with nonproductive groups. Here are some common causes.

1. Apathy--lack of enthusiasm, low response rate, yawning, quietness. Apathy may result from tension often felt in first meetings of the group, from lack of interest in the topic, or from a boring instructor. Whatever the cause, don't give up too soon. Even experienced instructors find that their learning groups sometimes become apathetic. Make time for small talk, kidding, and humor. Show as much enthusiasm and energy as possible. Do not give up if first attempts at motivating the group are unsuccessful. Use explicit and interesting examples to stimulate interest.

2. Hostility--arguing, sarcasm, personal antagonism toward other students and the instructor. Hostility may result from tensions among students, frustration or dissatisfaction with the school, or perhaps from some external or seemingly unrelated source. Dissatisfaction with housing or transporation problems can transfer directly to antagonism for the school and even for the learning group. Attempt to alleviate external and internal problems. Support students who assume suitable roles. Relieve tension with small talk and humor. If necessary, bring the situation into the open. Remind the group of its objectives.

3. Confusion--students ask directions excessively and complain that they are wasting their time. Listen to what students have to say and take the time to be especially understanding and provide needed direction. Structure will most likely be welcomed as students want to get to work. Do not emphasize the social aspect of the group. To do so will only postpone resolution of the problem.

Student Needs

Individual roles and group behavior come as a direct response to needs of students in the group. Although psychologists may disagree on the number and nature of human needs, two facts important to the learning group are commonly agreed upon: (1) some behavior is goal directed and results from a student being internally motivated (for example, a student will study to get a good grade in a course), and (2) other behavior can be brought about by teachers who are aware of student needs (for example, a teacher can show how the subject matter is important to the student). Whatever the case, student needs trigger behavior, and the instructors can influence student behavior by knowing student needs.

Probably the best known classification of needs is the one developed by Maslow.

1. Body--basic physiological needs for food, water, sleep, and air.

2. Safety (security)--protection from harm or injury.

3. Belonging--social need for warmth, acceptance, approval.

4. Self-esteem--for self-enhancement, competence, importance.

5. Self-actualization--for self-fulfillment, accomplishment, having arrived.

Maslow suggests that these needs must be satisfied sequentially. That is, once body needs are satisfied a person is concerned with satisfying safety needs. After safety needs are satisfied, then concern is for belonging and then self-esteem needs. Once the first four kinds of needs are satisfied, the person is concerned with becoming self-actualized.

Instructors who understand the direct relationship between student needs and the roles students play in the group will be better equipped to adjust their own teaching behavior within the group. More specifically, instructors will be able to find the most appropriate role or behavior for themselves in the learning group.

The Instructor as Leader

Instructors often need to assume task and maintenance roles like class member roles discussed earlier to help the group function effectively. But rather than simply play roles, instructors must vary their entire task and maintenance leadership behavior to fit the situation. Task behavior in the learning group relates to how instructors organize and define student roles and how the learning is structured by the instructor. Maintenance behavior is concerned with how instructors maintain good human relations with students by using open, supportive, helping actions.

The amount and kind of instructor involvement relate directly to the maturity of the group. In other words, although task and maintenance behavior by the instructor should vary with the situation, there are some predictable ways of how they should vary. More specifically, a certain pattern is generally appropriate:

1. High task and low maintenance with a new group.

2. High task and high maintenance as group begins to mature.

3. Low task and high maintenance as group reaches greater maturity.

4. Low task and low maintenance for fully mature groups.

The reasons for adjusting leadership behavior to the situation are many, but one of the prime reasons is that student needs change. Remember Maslow's classification of needs presented earlier. Consider the example of student seminar groups at a typical United States Air Force Professional Military Education course. It seems safe to assume that the students arrive with basic needs fairly well satisfied.

1. High task and low maintenance. Students gather in the auditorium to receive briefings and information important to them as new students. They are told where to go, what to do, what is expected of them, and how the school is run. Emphasis is on the task and structure of the school with very little consideration shown to them as individuals. School officials engage in very little maintenance behavior.

2. High task and high maintenance. Soon students are assigned to seminars or small learning groups with a seminar advisor or instructor. Still there is strong emphasis on the task. Students are told about general course requirements, communication skills requirements, and evaluation procedures. But the instructor also exhibits strong maintenance behavior. Students get to know each other and the instructor. They begin to feel more at ease. The instructor, knowing that their body and security needs are satisfied, is appealing to their need to belong. Certainly the need for task orientation and structure cannot be ignored early in the course when students need direction, but maintenance behavior is needed to give students a sense of belonging.

3. Low task and high maintenance. As the course progresses students gain confidence. They understand what is required of them and how to meet the requirements. They also feel as if they actually belong to their home seminar learning group. The work may still be demanding, but the atmosphere is more relaxed. The group is cohesive. Now students are striving for a sense of achievement. They want to do more than just belong to the group, they want to be thought of highly by the group. Recognizing the student's need for self-esteem and accomplishment of tasks on their own, the instructor should maintain high maintenance behavior, but reduce task behavior and say in effect, "I have confidence in you to make decisions and do the work without my looking over your shoulder."

4. Low task and low maintenance. When the course is nearly over and students have met the objectives, they are ready to graduate. The group will soon cease to meet, and the instructor will no longer lead. At this time very low task and low maintenance behavior by the instructor is appropriate. The group has fully matured and its members will go to their assignments.

The really effective instructor, then, is one who is able to use the correct balance of task and maintenance behavior to ensure that student needs are met and maximum learning takes place.

Summary

The small learning group is an important part of education. In learning groups the instructor must consider both the content or subject matter of the group and the process or interaction among group members in order to increase the benefits and decrease the limitations of small group learning.

Every group develops norms which regulate behavior and influence cohesiveness. Cohesive groups where students have high group loyalty exhibit higher morale, greater productivity, and more communication among members. Group cohesiveness can be increased by setting obtainable objectives, rewarding the group, and building group tradition. Cohesiveness promotes needed consensus or agreement by the group on major points. Consensus is encouraged when the instructor and students clarify the discussion, use process statements, seek different views, remain open to different views, and use group pronouns.

Students play roles in the learning group. Nonproductive student roles such as monopolizer, arguer, nonparticipant, and clown; and group problems of apathy, hostility, and confusion need to be dealt with by the instructor. Attention to student needs will help the instructor understand student roles and be able to assume the proper balance of task and maintenance behavior needed to promote a productive learning group.

Chapter 29

THE INSTRUCTOR AS A COUNSELOR

Effective counseling can improve student performance. Since few Air Force schools have full-time counselors, Air Force instructors should be prepared to counsel students when the need arises. This chapter will assist you in meeting this responsibility.

There are two major purposes of counseling outlined in the professional literature. One purpose is to help people make wise choices and decisions; the second is to help people be better adjusted or promote their mental health. When discussing Air Force academic counseling, our emphasis will be on helping students improve or change their behavior by making wise choices and decisions which will help their academic progress. The second purpose, to promote adjustment or mental health, should be left to professionals in the field of mental health.

In discussing counseling, we will first define the term and classify student requests for assistance. Next, we will examine the helping relationship which is so important in effective counseling. Third, we will discuss techniques and practices taken from three different counseling approaches. The last two sections provide direction for referring students when the need arises and legal guidance concerning confidentiality of information in a military counseling setting. References are provided at the end of the chapter which can assist in furthering the development of your counseling skill.

COUNSELING DEFINED

There are many definitions of counseling, but most of them do not seem appropriate to counseling students in military schools. By extracting three common characteristics from the various definitions, however, we can define counseling as 1. a process 2. involving a helping relationship 3. directed toward improvement or change in student behavior. Let us examine these characteristics in more detail.

Counseling as a Process

Counseling may be viewed as a three-phase process or cycle of helping. In the first phase, self-exploration, the instructor directs efforts toward establishing a base or building a good relationship with the student. During this phase the student is allowed to explore the problem in depth. The instructor uses listening skills, proper responses, and effective questioning techniques, along with empathy, respect, warmth, and genuineness in building the relationship.

Once the foundation for the relationship is established, the instructor helps the student gain self-understanding. The instructor assists the student in making some sense out of the many pieces of the puzzle. Although students think about their problems a great deal, they frequently are unable to change their behavior. A student may recognize that nightly visits to the club interfere with academic preparation and yet persist in this behavior. What is missing is commitment to change. Therefore, in this phase the student must not only understand the problem in depth, but make a commitment to follow through with a plan or program designed to correct the inappropriate behavior.

The final phase, student action, may be the most difficult. The instructor and student must devise a plan which the student can follow in resolving his or her problems. The instructor and student consider alternate plans and the possible consequences of these plans before selecting one. The emphasis is on outcomes and achievement of attainable goals.

These three phases illustrate counseling as a process. At the core of this process is the helping relationship.

The Helping Relationship

The second characteristic of counseling, the helping relationship, refers to interactions in which the instructor makes a determined effort to contribute in a positive way to the student's improvement. While shoe clerks, policemen, bankers, and politicians all provide help, the term "helping relationship" is not used to describe their services. Their primary purpose is not to assist in the personal development of the individual. In counseling, we establish a helping relationship by drawing upon ourselves in ways that help students live more in harmony with themselves and others, and with a greater understanding of themselves. The relationship develops because students need assistance, instruction, or understanding. Since the helping relationship is so important, most of this chapter will be devoted to this concept.

Improvement or Change in Student Behavior

The third characteristic of counseling, improvement or change in student behavior, describes the goal of counseling. Counseling can be considered successful when some kind of change or improvement occurs in a student's observable behavior. It is not enough, after counseling, for a student merely to speak of renewed confidence in, for example, lecturing before a group. Such a comment does not allow us to be sure our counseling was successful. However, if the student gets up in front of the class and presents the lecture with a new degree of confidence, then we have observable evidence that the behavior has changed or improved. Or consider a student who could not perform satisfactorily on tests because of a high anxiety level. Observable evidence after counseling intervention would be a report that the student took several tests without experiencing anxiety which interfered with test performance. While we cannot say with certainty that the change was the result of counseling, it is quite probable that counseling intervention contributed to the improved performance.

STUDENT REQUESTS FOR ASSISTANCE

Students will come to us asking for information, action, or understanding and involvement. If a student asks for information, we provide the appropriate verbal response. When the student asks for a handout from our lecture, we take the appropriate action to get it. Neither of these interactions would be classified as counseling. But when students verbalize a request for understanding or involvement, they are generally seeking a helping relationship and counseling is involved. Most students have occasions when they wish to talk with others about matters that are important to them. As instructors we must be alert for these needs even when they are not verbalized. With this type of request, we must be ready to enter into a helping relationship.

THE HELPING RELATIONSHIP

All theories and approaches to counseling stress the relationship between participants as the common ground for the helping process. Such a helping relationship allows the instructor to contribute in a positive way to the improvement of student performance. We often speak of the counselor's role as facilitating the change. Because the helping relationship is so significant in effective counseling, its key components need to be clearly understood.

The Counseling Environment

The setting in which counseling is conducted has some bearing on whether the relationship will be facilitated or thwarted. Our goal is to provide the atmosphere that will contribute most to communication.

Privacy. One of the most important physical considerations is privacy. Students desire and have a right not to be seen or heard by other students, instructors, or others when they enter into a counseling relationship. Nothing will limit the relationship more quickly than knowing others are able to hear or see what is taking place.

Chair Arrangement. Little research has gone into the effect of chair arrangement on the helping relationship. What research is available suggests that a seating position across the corner of a desk works well. Another arrangement is comfortable chairs placed close to each other at a ninety-degree angle with a small table nearby. Or you may find that a chair-facing-chair arrangement works better for you. Most students should be comfortable with a distance of approximately 30-40 inches between the counselor and themselves.

Avoid Interruptions. The instructor must establish rapport and build trust. Outside interruptions can only hinder. Phone calls, knocks on the door, people who want "just a word" with you, and secretaries who must have you sign this document "at once," may destroy in seconds what you and the student have tried hard to build over a period of time.

Student Folders. Information in a student's folder can be useful in preparing for a counseling session. However, the folder should be placed in a drawer or removed from view prior to the student's arrival. Otherwise the student may become more concerned with what is in the folder than in discussing the problem being encountered. As a word of caution, instructors must be careful not to prejudge students based upon information in the folder or to expect certain attitudes, behavior, or achievement from students based upon written comments of other instructors. To properly help students, we must remain objective in our relationship with them.

Confidentiality. Students seeking help from instructors may reveal intimate, personal, and sometimes painful details and experiences. Because such highly personal and private revelations may bring embarrassment or ridicule, students do not wish them to be disclosed. They usually assume that others will not have access to their disclosures without their express consent. When a student enters counseling under this assumption, a confidential relationship exists and the instructor is normally obligated to maintain this confidentiality. However, there are legal implications involved in addition to the ethical considerations.

A summary at the end of this chapter outlines your legal rights and responsibilities concerning confidentiality when counseling in a military setting.

Stages of a Helping Interview

We might think of the actual counseling interview in terms of stages labeled initiation, development, and closing. Earlier we discussed the development stage in terms of self-exploration, self-understanding/commitment, and action. Let us examine initiation and closing in more detail.

Initiation. During this stage you should work to establish rapport. You might focus upon some neutral topic or event known to you and the student. However, avoid trite conversational leads which may result in an increase in strained feelings, such as "It's a nice day, isn't it?" Being friendly, being attentive, and demonstrating interest to reduce student resistance are important, but don't make the mistake of consuming valuable time with extended idle conversation implying that the weather, sports, or activities are what the student wants to discuss.

Any opening conversation should be brief. Focus on the student's reason for being there. Statements such as "Please tell me what you wished to see me about," "I understand you wanted to see me," "I've asked you to come in because...," or "Please feel free to tell me what's on your mind" should get you off to a good start. Try avoiding the use of "May I help you?" and "What is the problem you would like us to discuss?" The words "help" and "problem" may hinder development of the relationship.

Counseling appointments should be initiated on time or a good and sufficient reason provided. Tell students how much time you have available for the counseling session. This procedure provides an important framework for the interview and allows the students to orient themselves. If available, thirty to forty-five minutes is generally sufficient for counseling sessions. However, few instructors will have the luxury of this much time. Structure the interview according to the time available.

Initiation ends when the instructor and student understand what is to be discussed and agree that it should be. Although the focus may shift to a more primary concern as the interview progresses, you have agreed to discuss a point and are ready to proceed to the development stage. (The phases in the developmental stage are discussed under Counseling as a Process on pages 28-1 and 28-2.)

Closing. Both partners in the interview should be aware that closing is taking place. During this stage no new material should be introduced or discussed. If such information does come out, schedule another counseling session. A concluding statement by the instructor may suffice. Or a short summation of the session with the agreed upon course of action by either the instructor or the student can effectively close out the session. Closing is especially important because what occurs during this last stage is likely to determine the student's impression of the interview as a whole.

Instructor Attitudes

The essential components of the helping relationship are attitudes rather than skills. For this reason, it has been difficult to analyze what good counselors do in establishing a helping relationship so others can be trained to do likewise. During a counseling session, instructors must communicate the attitudes of acceptance, understanding, and sincerity by their actions, words, gestures, and facial expression. The main skill instructors must develop is that of communicating this understanding of what the student is trying to express, and doing it in a warm, sincere way.

Acceptance (Warmth). Different authorities use different terms to describe this attitude or core condition of counseling. Some call it "unconditional positive regard" while others use the term "nonpossessive warmth." Primarily nonverbal, this instructor attitude is a direct outgrowth of the instructor's ability not to appear to judge. It involves a willingness to allow students to differ from one another and the realization that the experiences of each student are a complex pattern of striving, thinking, and feeling. The student experiences acceptance as a feeling of being unconditionally understood, liked, and respected. Acceptance—a positive, tolerant attitude on the part of the instructor--is one of the conditions that enables the student to change behavior.

Understanding (Empathy). Counseling is basically a perceptual task. It is not possible to learn to say the right thing at the right time without learning to listen, watch, and understand. While listening, instructors must put themselves in the student's place and try to see the circumstances as the student sees them, not as they look to an outsider. While simple to say, this is an attitude which seems hardest to learn. The first step in communicating this attitude is to listen carefully to what students say about how they feel because of what is happening to them. The next step is to think of words that represent the students' feelings and their situation. Finally, use words to tell students that you understand their feelings and their situation. For instance, if a student expresses concern about a relationship to an instructor, you might respond with empathy by saying, "Underneath your frustration, I can sense a great deal of anger. You're giving 100 percent, and instead of appreciating your effort, your instructor expects even more. That's pretty hard to take."

Sincerity (Genuineness). With this attitude, essential harmony exists between what the instructors say and do and what they really are. Sincerity is the opposite of phoniness. The instructor cannot role-play being a counselor. Each of us can sense from the tone of voice, gestures, or mannerisms of some of the actors used in TV commercials that they are playing a role. They are putting on a facade in saying things they don't feel. Thus, with this attitude you mean what you say and say what you feel, keeping in mind that you are trying to be helpful to the student.

Interviewing Skills

The following interviewing or communication skills can assist the instructor in developing a helping relationship with students:

Attending Behavior. These skills pertain to the physical behavior you exhibit while listening to another person. Your posture, eye contact, and facial expression carry messages to the student while you communicate. Effective attending skills communicate that you are interested. If the skills are ineffective, it is doubtful that a helping relationship will develop.

Effective attending behaviors show acceptance and respect for students. Eye contact is regular; movement is toward the students and not away. Your posture should be relaxed leaning slightly toward the students. Match your facial expression with your feelings or the students' feelings. Keep the voice clearly audible neither too loud nor too soft. Maintain a high energy level so you can stay alert throughout a long conversation.

Effective attending skills can be developed with practice although your initial efforts may seem mechanical. If you work hard at projecting acceptance, understanding, and sincerity, you will find good attending skills developing quite naturally.

Noting Non-Verbal Behavior. Student nonverbal responses are more likely to transmit the real message than the spoken one. Facial expression alone can transmit over half the meaning of a message. The nonverbal responses are automatic and the student will not generally be aware of them. However, do not fall into the trap of believing a certain non-verbal response can mean but one thing. Arms folded across the chest may mean defensiveness, but they may also mean the person is comfortable in that position, is cold, is covertly scratching, or has dirty hands. Nonverbal behavior also varies from culture to culture. Therefore, nonverbal behaviors must always be judged within the context of what is happening in the counseling session and their meaning considered tentative. In counseling sessions the students' nonverbal behaviors provide clues to possible underlying feelings or motives, but do not serve as proof they exist.

Questioning Techniques. Questioning is a common and very overused technique. Used improperly, it tends to make students see the counseling session as an inquisition in which they can sit back and think along the lines indicated by the questions. One question usually leads to another and before long the instructor is searching for additional questions to ask. Or the instructor may ask questions accusingly, arousing fear and suspicion on the part of students, instead of cooperation.

Used properly, questions can solicit needed information and direct student conversations to fruitful channels. When used, the questions should be open-ended and require more than a "yes" or "no" response. For instance, ask "How did you feel after the test?" instead of "You felt great after the test, didn't you?" Avoid double-barreled questions such as "Are my questions helpful, and are you learning more about yourself?" Use indirect questions where possible since they inquire without seeming to do so such as "You've been here at the school a week now. There must be a lot you want to talk about." Another example would be "You must have many thoughts about our new grading system."

Responding. Responding skills allow you to continue to communicate with the students without relying on questions. Through practice instructors can learn to use these responding skills which may seem mechanical at first but with practice become quite natural.

Restatement of content is an attempt to convey understanding either by simple repetition of or by rephrasing the communication. In restating you make no attempt to clarify, interpret, or organize what the student has said.

Reflection of feeling indicates the instructor's intent to show that the students' feelings or experiences are correctly understood. The focus is on student attitudes. Reflection techniques bring to the surface student feelings and attitudes. These techniques also bring problems into awareness without making a student feel pushed by the instructor. The instructor mirrors student attitudes so they can be clarified and understood. When properly achieved, reflection helps students feel deeply understood and clarifies student thinking so the situation can be seen more objectively. For instance, a student might say, "It's so hard knowing my wife is in the hospital while I'm in school and there's absolutely nothing I can do." To reflect feeling you would respond, "You feel anxious and entirely helpless right now."

The "mn-hm" response accompanied by a nod of the head is one of the most common reinforcing responses. Though not a word, it is a clearly uttered sound. When used, it indicates "Go on. I'm with you. I'm listening and following you."

Silence as a response can be difficult to master. We might consider two times when it is especially appropriate. A pause may come because students are thinking over what they have just expressed and interruption would be inadvisable. In another instance, silence may fall just after emotionally-laden expression by students, and quiet acceptance of this pause is appropriate.

Clarification is another important response. Perhaps you simplify what students have said to make it clearer, or you try to verbalize ideas and feelings students have had difficulty expressing clearly. When you clarify what students have said or tried to say, you are using this skill. At other times, you may need to have students clarify something they said to you. In this situation, an appropriate response may be a question such as "I'm sorry. I didn't quite understand your role in the argument. How did it get started?"

COUNSELING APPROACHES

Instructors who do even a moderate amount of counseling should give serious thought to the approach they use. Thought put into the selection of an approach should culminate in a theoretical base from which to operate. While the theoretical base need not be a fully developed, sophisticated theory of the counseling process, it should provide a structure or framework from which to operate. Without that framework or structure, instructors may find themselves floundering during counseling sessions with vague goals and no means of achieving them.

Once developed, a theoretical base will allow you to make comparisons between the body of unique information supplied by the student in counseling and a larger body of generalizations you have about human behavior. Since you must make predictions alone or with the student about the effects of each course of action available to the student, theory provides structure for making appropriate selections. A theoretical base can also tell you what facts you lack to achieve understanding of the student. Finally, it can help you identify reasons for your success or failure as you counsel your students.

Counseling approaches or theories might be categorized in many ways. The behavioral approach might represent one group, cognitive approaches a second, and affective approaches a third. While you may not have the required training or need to fully understand and use these theories, the techniques and practices from them may be useful in counseling students and in developing your own counseling approach. You may find yourself drawn to an approach because of your own view of people and how they should behave. As you become more knowledgeable, you may find that proper selection of techniques and practices from the different approaches increases the probability of giving appropriate help to your students. With experience, you may develop a theoretical approach that will assist you in giving the best possible help in the counseling situation.

To simplify our discussion we will select one theory from each approach for development.

A Cognitive Approach

Rational-emotive counselors view people as being capable of both rational and irrational (utterly illogical) thinking. A major element in his theory is that our emotions are caused and controlled by our thinking. What we think becomes our emotion.

Particularly important to this viewpoint is the concept that much of our emotional behavior stems from "self-talk" or internalized sentences. What we tell ourselves is or becomes our thoughts and emotions. Thus, our negative emotions such as fear, anxiety, embarrassment, and shame come from our thinking process. Simply stated, if we can learn to control our thinking, we can learn to control our emotions.

Let us consider an example. Before students get ready to give a speech, they start talking to themselves. The students picture all the things that can go wrong and anxiety starts to build. They continue to picture the worst possible outcomes, and the anxiety increases. Consequently, they then have difficulty performing because of their own irrational thinking which triggered the negative emotion of fear or anxiety.

Another common example occurs among students at teacher training schools. The thought of getting up in front of a group of students and teaching a 45-minute lesson produces negative thoughts. They start repeating the things that might go wrong and fear or anxiety starts to build. This negative self-talk continues. If they got up to teach and failed, the experience would be humiliating. If they could not teach the lesson, they would probably fail at the school. If they fail at the school, their entire military career will be affected. If their career starts going badly, the wives and children will be affected. The catastrophic thinking continues until they have worked themselves up into an emotional state that interferes with their school performance.

Counselors who borrow from rational-emotive theory would explain to the students how such self-talk brings on the very thing they are trying to avoid. They try to get the students to view the situation realistically. What is the probability that the worst possible thing will occur? What if they should fail the course? It might be in their best interest to know they should not go into a field for which they are not suited. By focusing on the faulty reasoning, emphasis shifts to eliminating self-talk that stands in the way of student progress and causes negative emotions which students do not have to be experiencing. The brain focuses on one thing at a time. If students change their thoughts from those that are negative to those that are positive, they can learn to control their emotions.

At other times students can make themselves miserable through their negative self-talk, telling themselves how much they hate being at your school or attending your course. By learning to view the situation realistically and cutting out the negative self-talk, the students can accept the situation and make the most of the experience.

A Behavioral Approach

Behavioral counseling has many applications in the military academic setting. According to behaviorists most human behavior is learned and is therefore subject to change. If we can change the students' environment, we can assist in altering their behavior. Our effectiveness in counseling and the outcome of the counseling can be assessed by changes in specific student behavior outside the counseling setting.

Basic to behavioral counseling is the principle of reinforcement. Rewards such as praise, affection, grades, and awards are given for appropriate behavior in hopes of getting students to repeat this type of behavior. For instance, if a student is commended for a good class presentation, this reinforcement should motivate the student to prepare well for the next lesson in hopes of again receiving recognition (called positive reinforcement).

At other times, a certain student response stops disapproval, criticism, or nagging from others. Thus, this behavior is reinforced by the removal of the disapproval, criticism, or nagging, and the particular response should occur again. For instance, a student does not get along well with other class members and is not accepted by the members. After counseling, the student responds to class members differently, stopping the disapproval. This new form of behavior has been reinforced and should continue to be used by the student (called negative reinforcement).

Student behavior that is not reinforced will be eliminated over a period of time. If students are no longer called on when they raise their hands, this form of behavior will eventually be eliminated in that classroom. Students who become overly dependent on an instructor will usually stop this practice if the instructor does not provide reinforcement for this type of behavior.

Instructors should also be aware that what they do and say serves to reinforce appropriate or inappropriate behavior. If we nod our head in counseling and say "mn hm," we are giving positive reinforcement to what students say or actions they have taken. This action encourages the student to continue. But if we do not like what students say or actions they propose, we should avoid reinforcement with head nods and our responses.

When using behavioral techniques in counseling, we should help students outline a course of action during which we know a good chance exists for them to receive positive reinforcement. Thus, there is a good chance for a positive change in behavior. However, if we outline a course of action where the probability of failure is high, then student behavior may get worse or show no improvement.

An Affective Approach

One affective (or humanistic) approach is client-centered counseling. This approach stresses student ability to determine the issues important to them and to solve their own problems. Client-centered counselors see students as basically good and behavior as being purposeful or goal directed. If placed in the proper counseling relationship and given the opportunity, students will choose courses of action that will lead toward actualization of their potential. The instructor's primary responsibility is to create a helping relationship in which students can gain self-understanding and self-acceptance. Enhancement of the self-concept and actualization of potential are at the core of client-centered counseling.

The client-centered approach might be especially effective in situations where students are grappling with personal conflict. Consider, for example, situations in which students must decide to stay in school and complete a course or withdraw to return home to solve or deal with a difficult family problem. Either option is feasible from an administrative standpoint. From your point of view, the student should return home, resolve the problem, and return to complete the course at a later time. However, no one knows the students and their total situation better than they do; consequently, only they can make the most reasonable choice.

In these cases, for example, the self-concept of the students may include attitudes about themselves that preclude their being quitters or leaving commitments unfulfilled. What seemed to you the wisest choice would not necessarily be the best one from the internal vantage point of these students. Your task as a client-centered instructor/counselor is to establish a helping relationship in which students know they are accepted and in which they are free to make choices without fear of losing your regard and understanding. In this helping relationship, students will generally choose the course that is best for them.

Many military instructors will be dealing with immature students who have never taken responsibility for their own behavior or actions. With these students the client-centered approach is often particularly effective. If certain students consistently ask your opinion on how to handle problem situations, work at establishing a helping relationship with them. Give them the responsibility for resolving the problem situation. Also give positive recognition if they are successful as a form of reinforcement.

Your own view of people may be similar to that of Rogers. If so, you will probably be comfortable working at establishing a strong helping relationship with students and allowing them to solve their own problems. When establishing the helping relationship, keep in mind that Rogers believes it is the attitudes of the counselor rather than techniques that facilitate counseling. Thus, with the client-centered approach, your focus will be on the students, not you as the instructor. You should see a decreasing need for your assistance as students mature in problem-solving.

REFERRAL

Referral is the process of finding someone else to help the student. Occasionally you may encounter students who have problems which are not educational or which call for specialized service. Referral to a professionally qualified person is more appropriate than attempting to help solve the problem. Marriage and family concerns, drug and alcohol abuse, and emotional disturbances brought on by stress are common problems instructors encounter among members of their student body where referral is appropriate. Or students may need specialized assistance from the legal office, social actions, or another base or community agency. Even though the problem may not be serious, in all of these cases referral action is appropriate, because few Air Force instructors have the required education and training for helping students with these concerns. As teachers, we must recognize when the needs of a student call for assistance beyond the scope of our training.

Instructors should be familiar with the referral possibilities before suggesting this course of action to the student. What kind of special service does this person require? Is it available and, if so, where? First assess the resources of your own school. Perhaps you have staff members who have the professional training required for dealing with a particular concern. Second, determine the extent of services available on your base. A base mental health clinic may be able to handle a variety of problems because of the diverse backgrounds of the professionals assigned. The drug and alcohol abuse unit of your social actions office can give specialized assistance, and one or more of the base chaplains may have been trained as counselors. A variety of community services is also available to military personnel and should not be overlooked as referral possibilities.

When referral becomes a consideration, do not hesitate to discuss the situation with your supervisor or someone on your faculty who has professional training. You may need to call base or community agencies for their recommendation.

A student may show resistance, doubt, fear, guilt, or defensiveness when you suggest referral. You must be prepared to cope with these reactions. When suggesting referral, communicate your acceptance, understanding, and concern just as you did in establishing the helping relationship. Offer to make the contacts and arrangements with the referral resource and assist in any way possible. Arrange for a follow-up with either the agency or the student to determine if you need to help further.

When suggesting referral, students may indicate they would prefer making their own contact with the referral source. If so, you should attempt to arrange a follow-up procedure to determine how you might be of further assistance. The student may also reject the referral attempt. If so, do not interpret this reaction as a failure on your part. The student may now be more openly facing the problem as a result of the counseling intervention, or the student may have decided upon another course or action.

CONFIDENTIALITY OF COMMUNICATIONS

The following guidance on confidentiality of communications between an instructor and a student was provided by the Air University Staff Judge Advocate's office on 17 May 1978:

1. The military does not recognize any legally enforceable "privileged communication" between a counselor and counselee, as is the case in attorney-client, clergy-penitent, doctor-patient, or husband-wife communications, although a doctor has no privilege to withhold communications concerning criminal acts. A promise by a counselor of confidentiality cannot override the legal requirement to report crimes and a counselor who is told of a criminal act committed or about to be committed must report this information or be personally subject to criminal prosecution. The breach of confidentiality, in and of itself, does not give rise to grounds for legal action in libel or slander; further the counselor has an absolute privilege from libel or slander actions when testifying in court or before an administrative body.

2. A promise of confidentiality restricts the disclosure of such information to only the principal purposes and routine uses for which it is sought. Disclosure of this confidential information will be limited to only those employees who require the information for the performance of their official duties (this also allows access by military law enforcement personnel). Counselors should familiarize themselves with AFR 12-35, the Privacy Act, and AFR 12-30, the Freedom of Information Act.

3. No civilian jurisdictions recognize a privilege for communications with a counselor, although some allow a privilege for communications with a "social worker," the definition of which varies and most likely would not include a military counselor in the instructional and academic environment. Disclosure of information to non-DOD sources is limited and is also governed by AFR 12-35, the Privacy Act and AFR 12-30, the Freedom of Information Act. Disclosure is authorized to, among other groups, a civil or criminal law enforcement activity and to a court pursuant to a valid subpoena. Counselors would be subject to judicial sanctions when no legal basis for declining to testify or withholding documents exists, and the absolute privilege against libel or slander actions for witnesses mentioned above is applicable also to civilian judicial or quasi-judicial administrative hearings.

4. Counselors should consult with their local Documentation Management Office and Judge Advocate officials to resolve any uncertainty.

SUMMARY

Effective counseling can improve student performance. Therefore, Air Force instructors should be prepared to counsel students when the need arises.

Definitions of counseling stress that counseling is a process involving a helping relationship directed toward improvement or change in student behavior. The purpose of counseling in the Air Force academic setting is to assist students in making wise choices and decisions.

All theories and approaches to counseling stress the relationship between participants as the common ground for the helping process. A helping relationship allows the instructor to contribute in a facilitating, positive way to the improvement of student performance. Establishing a proper environment for counseling, developing the interview by stages, projecting proper attitudes in the session, and using appropriate interviewing skills are important considerations in establishing a helping relationship.

Once fundamentals of the helping relationship are mastered, instructors can give serious attention to developing an approach to counseling. Techniques and practices from different theories can be useful in counseling students and developing a counseling approach. With experience, the instructor may develop a theoretical approach that will assist in giving the best possible help in the counseling situation.

Instructors must recognize that the needs of students occasionally call for assistance beyond the scope of their training in counseling. Referral is the process of finding someone else to help the student at such times. Instructors should familiarize themselves with sources of assistance both on base and in the civilian community.

Confidentiality of communications between instructors and students in a counseling relationship is essential. However, there are instances in military settings when confidentiality cannot be maintained. Instructors should contact the nearest base legal office if guidance is needed.

Chapter 30

THE SELF-CONCEPT

Educators and psychologists are becoming increasingly aware that the self-concept of students is closely connected to how they learn and behave. Increasing research evidence indicates that lack of academic involvement, misdirected motivation, and low performance in academic subjects characteristic of under-achievers, failures, dropouts, and the culturally disadvantaged may be due in part to negative self-concepts. These students have difficulty in the classroom because they do not believe they can do academic work. When these students say, "I'll never pass this test, I just know it," they are reflecting something about how they feel about themselves. With this attitude chances are increased that they will not do well on the test. Thus, their performance depends not only on how intelligent they are, but also on how intelligent they think they are.

Current literature and research are also suggesting a close link between the self-concept and mental health. Such evidence leaves little doubt but that mental health of individuals depends deeply on the quality of their feelings about themselves. Just as individuals must maintain a healthy view of the world around them, so must they learn to perceive themselves in positive ways. It is not the people who feel they are liked, wanted, accepted, and able who fill our prisons and mental hospitals. Rather it is those who feel deeply inadequate, unliked, unwanted, unaccepted, and unable.

Recognizing the importance of the self-concept, instructors should also realize that the self-concept of students can be changed, for better or worse, through their experiences in the academic environment. While successful experiences in schools are no guarantee of a generally positive self-concept, they do increase the probability that such will be the case. In contrast, unsuccessful experiences in school guarantee that these individuals will develop a negative academic self-concept and increase the probability of their developing a negative overall self-concept.

In this section of the chapter we will describe important facets of the self-concept, explain certain environmental forces that have shaped the academic self-concepts of students, summarize the role of defense mechanisms in protecting the self-concept, and identify actions an instructor can take to enhance the self-concept of students.

DESCRIPTION OF THE SELF-CONCEPT

All of us have a mental blueprint or picture of ourselves. This blueprint is composed of a system of interrelated ideas, attitudes, values, and commitments which are influenced by our past experiences, our successes and failures, our triumphs, our humiliations, and the way others reacted to us especially during our formative years. Consequently, we arrived at a more or less stable framework of beliefs about ourselves and have proceeded to live in a consistent manner within that framework. This framework is known as the self-concept, although the terms self-perception, self-image, and self-structure are often used to describe the beliefs. Thus, we act like the person we conceive ourselves to be. In fact, it is difficult to act otherwise even with conscious effort and willpower.

Once established, the mental blueprint or picture of ourselves provides a screen through which everything else is seen, heard, evaluated, and understood. The likelihood is increased that our behavior will cause others to respond toward us in ways which validate and support our self-concept. If the self-concept is generally positive, it engenders self-respect and confidence, while a generally negative self-concept leads to feelings of inadequacy and a lack of confidence.

The self-concept may also be thought of as a theory we have about ourselves. Just as we use data from our experiences to make inferences about the world and the people with whom we interact, so, too, do we make inferences about ourselves by observing our own behavior and the reactions of other people to us. Our self-theory affects our behavior, but our behavior in turn affects our self-theory — a theory continually being tested and revised.

We might speak of a student's self-concept in terms of levels in a hierarchy. At the top is the general self-concept representing a set of beliefs students hold about themselves. At the next level are three major areas of self-concept for students: academic, social, and physical. Finally, we come to specific areas of self-concept related directly to a kind of activity or subject matter area. These specific self-concept areas are probably the easiest to change, while the general self-concept is the most difficult. Under academic self-concept would be specific areas such as mathematics, English, and history ability self-concepts. Under social self-concept would be such areas as friendship, dating, and dancing self-concepts. The physical self-concept would include athletic and handsomeness or beauty self-concepts. Successes or failures of students directly affect specific self-concepts. The plusses and minuses in specific areas affect the major areas of self-concept which, in turn, affect the overall self-concept.

With this knowledge of what the self-concept is, let us turn to an explanation of environmental forces which may have shaped the self-concepts of students we will be dealing with in the academic environment.

FORMATION OF THE ACADEMIC SELF-CONCEPT

While instructors should strive to improve the general self-concept of students, their best chance for success is in improving the scholastic or academic self-concept. Our appreciation of a student's academic self-concept will be enhanced if we understand the role parents, teachers, peers, and the school have played in shaping that self-concept.

Parental feedback and evaluation, caring or lack of it, and acceptance or rejection have a striking effect on how students view their general intellectual ability and ability in specific subject areas. Research suggests that parents who combine caring, acceptance, and high but reasonable expectations are likely to rear children who think well of themselves and who strive to do as well as they can in school. Parents who pay no attention at all to the academic accomplishments or failures of children, or who attend only to the children's failures and rarely to their successes, are contributing to the development of a negative academic self-concept. Thus, the type and amount of reinforcement coming from parents has a significant effect on children's academic achievement and their academic self-concept.

Students who complete secondary school have devoted nearly 20,000 hours to school and related activities. During this long period of time (including some of the most impressionable stages of the person's development), students are being taught the curriculum of the school and another based on interactions of persons within the school. The latter curriculum teaches students who they are in relation to others and their place in the world of people, ideas, and activities. They may learn the latter curriculum more slowly, but it won't be forgotten as easily as the school curriculum.

Not only does the school provide the stage upon which most of the drama of a person's formative years is played, but it houses the most critical audience in the world--teachers and peers. And it is here, in the face of their severest critics, that students whether in kindergarten, graduate school, or Air Force schools are likely to be reminded again and again of either their failings and shortcomings or of their strengths and possibilities.

The role of the teachers in the development and change of the self-concept is enormous. Research shows that students consider teachers to be "significant others" in their lives. What they say or do is important to the students. Teachers dispense rewards and punishment, acceptance and rejection on a colossal scale.

Peers also play an important role. By admiring those who succeed in school or seeking their assistance with problems, peers provide positive reinforcement for the academic self-concept. Similarly, when peers ridicule a classmate or point out deficiencies, they are contributing to the development of a negative academic self-concept.

While students may enjoy a few hours in which they are not judged (relative to others) by teachers, peers, family, and others, there are few school hours in which they are not judging themselves against the standards set by themselves, by the teacher, by peers, and by their family. At no other time in their career as a worker, member of a family, citizen, or person engaging in leisure activities will they be judged so frequently by others, and it is possible, by themselves. These relative judgments arise because almost all of a student's school learning occurs as a member of a group. Judgments are made frequently because schools have for so long stressed competition as a primary motivational technique. Relative rather than absolute norms are the bases for most judgments.

Because of the sequential nature of learning tasks and their consistency from year to year, the student tends to remain in much the same position relative to other students. This results in stability of school marks and test performance. In general, the more public and official the judgments (or marks), the greater the effect they are likely to have on the student's perception of adequacy in the subject. Sooner or later such students are forced to accept some judgment about their capability with group or learning tasks.

Over a period of time the students gradually acquire a consistent performance as the tasks accumulate in large numbers. If their performance has been adequate, they approach the next task with confidence that they can do it well. If their performance has been inadequate, they come to believe in their inadequacy with respect to this type of learning.

They approach the next tasks with marked reluctance. If the experience was painful enough, the task will be avoided or at least approached with little enthusiasm or marked dislike. Thus, the student's subjective feelings about a subject or set of learning tasks are much influenced by their perceptions of their adequacy or inadequacy with such tasks. Generally, adequacy or inadequacy for most students is defined in terms of their standing in the upper or lower portions of the local distribution of marks.

Success (or adequacy) in a school subject opens it up for further consideration and use. Failure in a school subject may effectively close this subject for further consideration. As various indices accumulate, students gradually begin to generalize about their adequacy or inadequacy with school learning tasks. If they have positive experiences, they are likely to develop a generally positive view about school and school learning. If the experiences are negative and their learning is regarded as inadequate by the students, their teachers, and parents, they are likely to develop a negative view about school and school learning. All individuals who accumulate experiences of failure (or success) to some point (which varies from individual to individual) will develop a negative or a positive affect toward school. Given a sufficient number of unsuccessful learning experiences, nearly everyone must succumb to an acceptance of a negative or inadequate self-view about learning.

Thus, we might conclude that the academic self-concepts of students in our classrooms were formed primarily during the critical years in the elementary and junior high school periods. The frequency and consistency with which they received positive or negative feedback from parents, teachers, and peers largely shaped the academic self-concept they bring into our Air Force classrooms.

Once the self-concept is formed, students will attempt to defend this concept of self through the use of defense mechanisms. These mechanisms will influence behavior of students in our classrooms.

MECHANISMS TO DEFEND THE SELF

Whether we are aware of it or not, all of us use certain defense mechanisms to preserve or protect our self-systems. In fact, our success in meeting daily stresses and strains of living can be traced to our effectiveness in using certain defenses. However, if we use them to avoid assuming responsibility, to avoid risk taking, or to develop excuses for immature or self-defeating behavior, then they can have a negative effect on our behavior. Their use is normal unless they begin to interfere with the maintenance of self-esteem rather than aiding it.

Defense mechanisms can best be understood in view of the objective they serve, which is to safeguard the integrity and worth of the self. Some of the most common in the academic environment follow.

Compensation

Here we attempt to disguise the presence of a weak or undesirable quality by emphasizing a more positive one, or reduce tension by accepting and developing a less preferred but more attainable objective for a more preferred but less attainable objective. Students who regard themselves as unattractive may develop exceptionally winning personalities to compensate. Students may say that they would rather spend their evenings working on lesson plans than anything else they can think of when they would rather be with a person of the opposite sex who has resisted their dating requests.

Projection

With this mechanism we relegate the blame for our own shortcomings, mistakes, and transgressions to others or attribute our own motives, desires, characteristics, and impulses to others. The athlete who fails to make the team may feel sure the coach was unfair, or the tennis player who examines the racket after a missed shot is projecting blame. When students say, "Everybody will cheat on an exam if given the chance," they are projecting.

Rationalization

Rationalization aids in softening disappointment when we don't reach our goals and helps us come up with excuses when we do something we believe we shouldn't but want to anyhow. Heavy smokers rationalize when they say, "The relationship between cancer and smoking isn't conclusive, and if we should get it in the future, a cure will be discovered by then." Other students rationalize when they say, "We had to cheat because others were and we might not have passed the course otherwise," when in reality they didn't know the material.

Denial of Reality

Often we can ignore or refuse to acknowledge disagreeable realities. We turn away from unpleasant sights, refuse to discuss unpleasant topics, deny criticism, and become so involved with work that we don't have to deal with marital, child-rearing, or other personal problems.

Reaction Formation

Sometimes individuals protect themselves from dangerous desires by not only repressing them, but actually developing conscious attitudes and behavior patterns that are just the opposite. A student may develop a "who cares how other people feel" attitude to cover up feelings of loneliness and a hunger for acceptance.

Information on these and other defense mechanisms such as fantasy, repression, displacement, emotional insulation, regression, and introjection can be obtained from a good psychology text. The instructor should recognize that the mechanisms are used to preserve the self. As learned behaviors, they function as relatively automatic and habitual levels and involve some measure of self-deception and reality distortion. Because they soften failure, alleviate anxiety and hurt, and protect our feelings of adequacy and worth, we can consider them normal adjustive reactions unless they seriously interfere with the effective resolution of stress situations.

While defense mechanisms are learned behaviors, so are student feelings about themselves learned responses. Students need to unlearn bad feelings and acquire new feelings. While this is not always easy, it is possible. Through purposeful effort Air Force instructors can enhance the self-concepts of students in their classrooms by helping them acquire new feelings about themselves.

ENHANCING THE SELF-CONCEPT

Thus far in our discussion, we have reasoned that the past experiences of students can have a vast influence on their current behavior. Their behavior is influenced not only by the accumulation of their past and current experiences, but even more importantly, it is influenced by the personal meanings they attach to their perception of these experiences. Their behavior is more than simply a function of what happens to them from the outside. It is also a function of how they feel about themselves on the inside. Although they cannot change what happened to them yesterday, they can change how they feel about it today. They cannot change the event, but can modify the perceptions they have about the event. In this manner, they can change their view of themselves or their self-concept.

Before examining specific suggestions for improving the self-concept of students, we need to deal with the question of which comes first, a change in academic self-concept leading to improved academic performance or improved academic performance leading to an improved academic self-concept? It does not seem unreasonable to suggest that each is mutually reinforcing to the other to the extent that a positive change in one facilitates a positive change in the other. If students begin an Air Force school with a low level of self-confidence or self-regard and experience sufficient success, we would reasonably expect that their concept of self as far as school ability is concerned would be elevated. However, if students begin an Air Force school with high confidence in their ability to do the academic work and experience excessive failure, their concept of self may be lowered. Under the latter conditions students must shift focus to other areas, usually nonacademic, to maintain self-esteem, or continue to lose self-confidence and self-esteem.

Let us examine some specific suggestions for improving the self-concepts of students in Air Force schools.

Give Recognition

In transactional analysis, the term positive strokes is used. Behaviorists talk in terms of positive reinforcement. Adlerian psychologists use the term encouragement. The concept is similar in each case. When students do something worthy of recognition, instructors need to give positive feedback to the students. Such recognition makes the students feel alive, important, and significant. An achievement, an innovative or creative idea, or a good effort all deserve recognition from the instructor. Such feedback is most important in improving any student's self-concept. Remember that you have the power to help students recognize their strengths and possibilities or to remind them again and again of their weaknesses and shortcomings.

Serve as a Good Model

As an instructor you will have a considerable influence on student self-attitudes, particularly as these attitudes are related to feelings about being able to think, answer questions, and solve problems. You will quickly be established as a significant person in the eyes of most of your students. Perhaps you will be significant because you are the only person in the school environment who makes a particular student feel like an individual of worth and value. While all students deserve to have their total development facilitated by a truly competent human being--their instructor--you cannot teach what you do not know well yourself. As an instructor, you should strive to grow and live fully if you are to help students learn to do likewise. Research indicates that teachers who have low self-concepts tend to have students in their classrooms who have lower self-concepts, while students in classrooms where teachers have positive self-concepts tend to have higher self-concepts. Just as leaders must model appropriate behavior for followers, so must instructors provide positive models for their students. Thus, effort directed toward improving your own self-concept may lead to an improved self-concept for students in your classrooms.

Stimulate Cooperation not Competition Among Students

Modern society places a lot of emphasis on competition. While competition with the self can lead to improved performance as students strive to do their best, competition against others can result in negative perceptions of the self if the students happen to lose more than they win. With cooperation, everyone can experience the success of the group, and no one is viewed as the winner or loser.

Consider Mastery Learning

Mastery learning was discussed in Chapter 27 as a concept designed to meet individual needs of students. Using this approach, a student's performance is measured against objectives rather than against the performance of other students. The instructor determines mastery, which often means achieving 80 to 85% of the course objectives. Time is the most crucial variable. Each student must be provided with sufficient time to achieve mastery. Theoretically, when the proper instruction is provided, along with proper diagnostic techniques and correctives (tutoring, programmed instruction, reteaching), 90% of a given group of students will achieve mastery.

When used properly with appropriate subjects, mastery learning appears to be able to eliminate most of the effects of individual differences on level of achievement. Each student is provided with an excellent opportunity for success. When grades are given, most students get an "A" or "B" indicating mastery. Mastery learning becomes both a subjective recognition by students of their own competence and public recognition of this competence by the school or society. While approximately 25% of students achieve the desired performance standards ("A" or "B") in conventional group based instructional programs, research indicates nearly 75% of the students are reaching the same performance standards with mastery learning. The impact on the student's self-concept is significant. Mastery learning seems to have the potential to insure each student a history of successful and rewarding school learning experiences and, in the process, to shape positive affective development.

Despite this potential for enhancing a student's self-concept, mastery learning has limitations that may preclude its use in your educational setting (see Chapter 27).

Have High but Reasonable Expectations for Students

There is a considerable amount of research that suggests students perform up to the expectations that teachers have for them. If teachers or instructors expect students to be good or poor, or well behaved or delinquent, or whatever, then they are likely to encourage and reinforce the very behavior they expected in the first place. If instructors are prejudiced or have a tendency to stereotype students, they are setting up expectations which can have a negative effect on student performance. What the research is beginning to tell us is what common sense has always told us; namely, students grow, flourish, and develop much more easily when in a relationship with someone who projects an inherent trust and belief in their capacity to become what they have the potential to become.

Recognize Potential in Students

During the past two decades, an increasing number of behavioral scients have concluded that humans function at 10 percent or less of their potential. For instance, scientists tell us that the human mind can store as many as 600 memories a second for a lifetime of 75 years without the slightest strain. It is estimated that our brain has the capacity to learn as many as 40 languages and would allow us to complete the required courses of dozens of colleges. If these statements on the capacity of the brain are true, new means and methods must be designed to actualize a person's vast possibilities and latent powers. However, most of today's physical and cultural environment works in opposition to the development of this potential. A negative self-concept certainly stands in the way of releasing the potential of students. So the next time you have students who tell you they can't, tell them that they can. And even when you suspect that maybe they really can't, tell them they can; and who knows, they just might.

Summary

In this chapter we have seen that the self-concept of students is an important determiner of academic achievement. The beliefs students have about themselves have a significant effect upon how they learn and behave.

Students have an overall self-concept which might be thought of as composed of physical, social, and scholastic self-concepts. The latter are composed of specific self-concepts which represent the areas where the instructor can have the most impact, since they are the easiest to change.

In understanding students, we need to realize the impact that parents, teachers, peers, and the school environment have had in shaping their academic self-concept. While these groups are judging the students, so are the students judging themselves. Once the perceptions of self begin to form, there is a good chance that they will be reinforced over a period of time especially if the students continue to interact with the same groups.

Defense mechanisms are used by students to preserve or protect their self-systems. Common ones encountered in the classroom include compensation, projection, rationalization, denial of reality, and reaction formation.

The self-concept can be changed, and instructors are in a strategic position for enhancing a student's self-concept. Giving recognition, modeling a positive self-concept, stimulating cooperation and not competition in the group, the use of mastery learning, having high but reasonable expectations, and working to release the potential that exists in each student are suggested means of enhancing the self-concept.

Attachment 1

EXPLANATION OF TERMS

AFFECTIVE DOMAIN--Major area of learning which deals with acquired attitudes, values, etc.

ANALYSIS--Level of cognitive domain (Bloom, 1956) in which students are able to break down complex organizational structures into their component parts.

ANTICIPATED RESPONSES--Answers expected from students in reply to planned instructor questions.

APPLICATION--Level of cognitive domain (Bloom, 1956) in which students are able to use learned material in new and concrete situations.

ATTENTION STEP--Segment of a lesson introduction in which an instructor gains the attention of the students and focuses upon the subject to be taught.

BEHAVIORAL INDICATORS--See Samples of Behavior.

BODY--Major section of a lesson during which learning activities are sufficiently developed to achieve instructional objectives; usually preceded by an introduction and followed by a conclusion.

CASE STUDY--A learning experience in which students encounter a real-life situation under the guidance of an instructor in order to achieve an instructional objective.

CHARACTERISTICS (of a concept)--See Critical Attributes.

CHARACTERIZATION--Highest level of affective domain (Krathwohl, 1956) in which students integrate values or value systems into their own life style or philosophy of life.

CLARIFICATION SUPPORT--Type of instructional material used during the body of a lesson to develop understanding and clarify ideas; may include definitions, examples, comparisons, statistics, or testimony from experts and trustworthy sources.

CLOSURE--The final segment of a lesson conclusion during which instruction is appropriately ended.

COGNITIVE DOMAIN--Major area of learning which deals with acquiring knowledge and developing understanding.

COMPREHENSION--Level of cognitive domain (Bloom, 1956) in which students begin to develop understanding and are able to translate, interpret, and extrapolate subject matter under study.

COMPREHENSION-LEVEL SUMMARY--Segment of a comprehension-level lesson during which the instructor reviews and expands on key material and develops relationships which lead to a generalization which is or supports the instructional objective.

COMPREHENSIVENESS--A characteristic of evaluation which requires that the stated objectives of instruction be liberally tested or rated.

CONCEPT--A class of people, objects, events, ideas, or actions which are grouped together on the basis of shared critical attributes or characteristics, and are called the same name.

CONCLUSION--Major section of a lesson; usually follows an introduction and body of the lesson; often contains a summary, remotivation step, and closure.

CONDITION STATEMENT--Part of a criterion objective which describes the testing environment including those problems, materials, and supplies which will be given (included) or specifically excluded from a measurement situation.

COUNSELING--A process involving a helping relationship directed toward improvement or change in student behavior.

CREATIVITY--The imaginative recombination of known elements into something new and useful.

CRITERION OBJECTIVE--A precise description of a student-centered learning outcome for a planned program of instruction which describes the performance and describes or infers the conditions and standards for assessment through criterion-referenced testing.

CRITERION-REFERENCED TEST--Any test of carefully written measurable objectives to obtain data to compare student performance levels with that specified in the objectives.

CRITICAL ATTRIBUTES--Characteristics necessary for determining class membership in a concept.

DEDUCTIVE REASONING--Mental process in which we start with a principle to be taught and then apply this principle in specific instances to form supporting main points.

DEMONSTRATION-PERFORMANCE METHOD--A learning experience in which students observe and then participate in a sequence of events designed to teach a procedure, a technique, or an operation, frequently combining oral explanation with the operation or handling of systems, equipment, or materials.

DEMONSTRATION PHASE--A phase of the demonstration-performance teaching method during which the instructor shows students how to perform the skill to be learned.

DIFFERENTIATION--A characteristic of evaluation which requires that tests and rating instruments be capable of making distinctions between selected groups, usually masters or non-masters of specific instructional objectives (in criterion-referenced testing) or high and low overall test performers (in norm-referenced testing).

DIRECT QUESTION--An instructor-initiated question addressed to a particular student to elicit involvement, to seek an opinion, or to draw out support.

DISCRIMINATION--The mental ability to identify a nonexample of a concept which shares some but not all the critical attributes of that concept.

DOMAIN OF LEARNING--A gross classification of learning outcomes into one of three primary but not necessarily materially exclusive categories: cognitive (thinking, understanding), affective (attitudes, values), and psychomotor (physical skills).

EDUCATIONAL OBJECTIVE--See Student-Centered Instructional Objective.

EVALUATION-- The systematic process of judging how well individuals, procedures, or programs have met educational objectives.

EVALUATION PHASE--A phase of the demonstration-performance teaching method during which the instructor conducts criterion-referenced testing to determine the extent to which students have mastered the instructional objectives.

EXAMPLES (in concept teaching)--People, objects, events, ideas, or actions which have all the critical attributes of a particular concept and can be correctly called by that concept name.

EXPLANATION PHASE--A phase of the demonstration-performance teaching method during which the instructor tells the students how to perform the skill to be learned.

EXTRAPOLATION--A sub-level of the comprehension level of learning (Bloom, 1956) in which students develop sufficient understanding to estimate trends or predict outcomes based upon the subject matter under study.

FEEDBACK FOR LEARNING--Information students receive from their instructor about their performance which will cause them to take self corrective action and guide them in attaining the goals of the course more effectively.

FOLLOW-UP QUESTION--An instructor-initiated question to a particular student or group of students designed to guide the lesson progression by supplying sub-ideas and promoting reasoning.

FORMAL LECTURE--A structured and often rehearsed teaching lecture with no verbal participation by students.

FORMATIVE EVALUATION--Ongoing evaluation of student progress toward instructional objectives during the learning experience.

GENERALIZATION--The mental ability to identify an example of a concept because it shares all of the critical attributes of that concept.

GUIDED DISCUSSION METHOD--A learning experience in which students participate in an instructor-controlled, interactive process of sharing information and experiences related to achieving an instructional objective.

HELPING RELATIONSHIP--Face-to-face interactions in which the instructor applies effective human relations skills to help a student or group of students attain a goal or goals.

HIGHER LEVELS OF LEARNING--Those levels of learning above the comprehension level (Bloom, 1956) which may be considered as the practical application of concepts and principles to complex real problems.

INDUCTIVE REASONING--Mental process in which we ask students to examine pieces of evidence to form a related pattern and then draw a conclusion from the evidence.

INFORMAL LECTURE--An often conversational teaching lecture with considerable verbal interaction between instructor and student in the form of both questions and discussion.

INSTRUCTIONAL MEDIA--All forms of instructional aids which give audio or visual support in a learning environment.

INSTRUCTIONAL OBJECTIVE--See Student-Centered Instructional Objective.

INSTRUCTIONAL SYSTEM DEVELOPMENT (ISD)--A systematic, but flexible, process used to plan, develop, and manage efficient education and training programs.

INTERPRETATION--A sub-level of the comprehension level of learning (Bloom, 1956) in which students develop sufficient understanding to see relationships between various aspects of a communication and are able to perform such activities as making inferences, generalization, and summations.

INTRODUCTION--Major section of a lesson designed to establish a common ground between the instructor and students, to capture and hold attention, to outline the lesson and relate it to the overall course, to point out benefits to the student, and to lead the student into the body of the lesson; usually contains attention step, motivation step, and overview.

ISD--See Instructional System Development (ISD).

KNOWLEDGE--Lowest level of cognitive domain (Bloom, 1956) in which students have the ability to recall or recognize material in essentially the same form as it was taught.

KNOWLEDGE LEVEL SUMMARY--A reiteration of key points of content in a knowledge-level lesson designed to enhance a student's ability to remember facts.

LEAD-OFF QUESTION--An instructor-initiated question usually directed to a group of students at the beginning of a lesson or main point and designed to generate discussion.

LEARNING--A change in the behavior of the learner as a result of experience or insight. The behavior can be physical and overt, or it can be intellectual or attitudinal.

LEARNING CENTER--A learning environment which has been specifically developed to foster individualized instruction and which emphasizes employment of instructional media to augment textbooks and manuals.

LECTURE--See teaching lecture, formal lecture, and informal lecture.

LESSON PLAN--A teaching/learning plan which includes student-centered instructional objectives, detailed content outline, and significant details describing the period of instruction such as instructional media, teaching method, and length of period.

LEVEL OF LEARNING--The degree to which a student is expected to develop knowledge or understanding of a subject, internalize a set of values, or display proficiency in a psychomotor skill.

LEVEL OF LEARNING OBJECTIVE--A student-centered instructional objective which states the intended subject matter for a planned program of learning activities and assigns a carefully defined taxonomy level or proficiency level to that subject matter to indicate the desired level of mastery.

MAIN POINTS--The logical breakout of subject matter in support of an instructional objective.

MASTERY LEARNING--An approach to curriculum development in which students progress from learning experience to learning experience based upon achievement of instructional objectives rather than other factors such as age, effort, or time of year.

MEASUREMENT--The act of acquiring data in the educational environment without making value judgments regarding the relative or absolute merits of those data.

METHOD OF INSTRUCTION--A planned program of instruction with characteristics sufficiently different from other alternatives to be identified as a major vehicle for the delivery of instruction.

MOTIVATION STEP--Segment of a lesson introduction in which an instructor provides specific reasons why students need to learn whatever they are about to learn.

NONEXAMPLES (in concept teaching)--People, objects, events, ideas, or actions which lack one or more critical attributes of a particular concept and cannot correctly be called by that concept name.

NORM-REFERENCED TEST--Any test designed to obtain data for rank ordering or otherwise comparing relative student performance.

OBJECTIVE--See Student-Centered Instructional Objective.

OBJECTIVITY--A characteristic of evaluation which requires that measurement in an educational environment be correct and factual and be free from instructor bias.

ORGANIZATION--Level of affective domain (Krathwohl, 1956) in which students compare, relate, and synthesize new values into their own value systems.

OVERHEAD QUESTION--An instructor-initiated question directed to an entire group rather than to a specific student and is one to which the instructor expects an answer.

OVERVIEW--Segment of a lesson introduction in which the instructor provides a clear and concise presentation of the objective, the key ideas or main points of the lesson, and an indication of the teaching method to be employed.

PATTERNS (lesson plan organization)--The logical ways of organizing main or sub-points of a lesson; includes time, space, problem/solution, pro/con, cause/effect, or topical.

PERFORMANCE--Part of a criterion objective which describes the observable student behavior (or the product of that behavior) which is acceptable to the instructor as proof that learning has occurred.

PERFORMANCE-SUPERVISION PHASE--A phase of the demonstration-performance teaching method during which students practice the skill to be learned under the supervision of the instructor.

POSTTEST--A test given to a student upon completion of a learning experience to measure achievement.

PRETEST--A test given to a student prior to entry into a learning experience to determine entry skills or knowledge; can be used to identify portions of the instruction the student can bypass.

PRINCIPLE--A statement of relationship between two or more concepts.

PROOF SUPPORT--Type of instructional material used during the body of a lesson which provides hard data or expert testimony in support of an assertion.

PSYCHOMOTOR DOMAIN--Major area of learning which deals with acquiring physical skills requiring dexterity, coordination, and muscular activity.

RATING SCALES--Any of a number of instruments upon which instructors record their assessments of student performance through a process of observation and judgment.

RECEIVING--Lowest level of affective domain (Krathwohl, 1956) in which students become aware of and pay attention to someone or something.

RELAY QUESTION--A student-initiated question directed to the instructor but which is redirected to another student to answer.

RELIABILITY--A characteristic of evaluation which requires that testing instruments yield consistent results.

REMOTIVATION STEP--Segment of a lesson conclusion during which the instructor reminds students why the information presented is important to the student as an individual so that students will have a desire to retain and use what they have learned.

RESPONDING--Level of affective domain (Krathwohl, 1956) in which students act or comply by performing an act and obtain satisfaction from it.

REVERSE QUESTION--A student-initiated question which is redirected by the instructor back to the student who asked it.

RHETORICAL QUESTION--An instructor-initiated overhead question directed to an entire group for which no answer is expected.

SAMPLES OF BEHAVIOR--Student behaviors which the instructor will accept as evidence of learning; the specific behavior in each sample is the variable, the taxonomy level (cognitive, affective, or psychomotor) of the set of samples is the constant and serves as the common denominator of each sample in the alternative.

SELF-CONCEPT--A more or less stable framework of beliefs about ourselves within which we live in a consistent manner.

SPONTANEOUS QUESTION--An instructor-initiated question used to seek clarification, probe for understanding, or to control the direction of the discussion; may be either direct or overhead question.

STANDARDS STATEMENT--Part of a criterion objective which describes the qualitative and quantitative criteria against which student performance or the product of that performance will be measured to determine successful learning.

STRATEGIES (lesson plan organization)--The logical arrangement of course content within a pattern or organization which will likely cause the most learning to occur.

STUDENT-CENTERED INSTRUCTIONAL OBJECTIVE--A desired outcome of learning described in terms of student skill, knowledge, or attitude; proof of learning may be obtained through direct measurement of limited, precise student behavior (criterion objective) or general evidence of learning may be inferred from measurements of a sampling of student behaviors (level of learning objectives).

SUMMARY--Segment of a lesson conclusion during which the instructor reiterates key points of lesson content (knowledge level) or reviews and expands on key material and develops relationships which lead to generalizations (comprehension level).

SUMMATIVE EVALUATION--Evaluation of student achievement of instructional objectives at the end of the learning experience.

SUPPORT--Type of instructional material used during the body of a lesson to support an assertion or to develop understanding; see Clarification Support and Proof Support.

SYNTHESIS--Level of cognitive domain (Bloom, 1956) in which students are able to put parts together to form new patterns or structures.

TASK STEPS--The sequential, component steps in a larger task; enroute behaviors to a criterion objective.

TAXONOMY OF EDUCATIONAL OBJECTIVES--A systematic classification scheme for sorting learning outcomes into three broad categories (cognitive, affective, and psychomotor) and rank ordering these outcomes in a developmental hierarchy from least complex to most complex.

TEACHING INTERVIEW--A learning experience in which an instructor questions a visiting expert and follows a highly structured plan which leads to educational objectives.

TEACHING LECTURE--A formal or informal presentation of information, concepts, or principles by a single individual.

TRANSITION--Statements used by the instructor to move from the introduction of a lesson to the body, between main points, between sub-points within each main point, and from the body to the conclusion of the lesson.

TRANSLATION--A sub-level of the comprehension level of learning (Bloom, 1956) in which students develop sufficient understanding to grasp the meaning of a concept, principle, or other communication.

VALIDITY--A characteristic of evaluation which requires that testing instruments measure exactly what they were intended to measure.

VALUING--Level of affective domain (Krathwohl, 1956) in which students accept, prefer, or commit themselves to an object or behavior because of its perceived worth or value; to appreciate.

VARIABLE ATTRIBUTES--Characteristics shared by some but not all members of a class of people, objects, events, ideas, or actions which are grouped together on the basis of shared critical attributes and called by the same concept name.

Attachment 2

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SUMMARY OF REVISED, DELETED, OR ADDED MATERIAL

This manual significantly changes the content of AFM 50-62, Principles and Techniques of Instruction, which it supersedes. The system used throughout the manual for writing and classifying instructional objectives (taxonomy) has been changed from one developed in-house to the Bloom Taxonomy of Learning Objectives. Chapters 7-9 have been added to provide instruction on planning learning outcomes to specific levels of learning. Chapter 10, "Writing and Measuring Affective Objectives," introduces those procedures necessary to define and measure changes in attitude. A new model for writing student-centered objectives and criterion-referenced test items has been introduced in Chapter 3, "Writing Student-Centered Objectives and Tests." The chapters on methods of teaching have been improved and updated. The basic approach to evaluation has been shifted from norm-referenced evaluation to criterion-referenced evaluation (especially Chapter 20, "Introduction to Evaluation," Chapter 22, "Measuring Learning Outcomes," and Chapter 24, "Criterion Referenced Evaluation"). Chapters 27-30, which deal with the student as an individual, have been updated and greatly expanded.

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